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THE
ZOOLOGICAL RECORD

VOLUME THE THIRTY-FIFTH.

BEING

RECORDS OF ZOOLOGICAL LITERATURE

RELATING CHIEFLY TO THE YEAR

1898.

BY J. A. THOMSON, R. LYDEKKER, R. BOWDLER SHARPE, G. A. BOULENGER,
W. A. HERDMAN, E. R. SYKES, E. A. SMITH, G. C. CRICK, A. W. BROWN,
D. SHARP, F. A. BATHER, FLORENCE BUCHANAN, R. T. GÜNTHER, AND
R. VON LENDENFELD.

EDITED (FOR THE ZOOLOGICAL SOCIETY OF LONDON) BY

DAVID SHARP, M.A., F.R.S., F.Z.S., &c.,

Curator in Zoology, University Museum of Zoology, Cambridge.

Explorate solum : sic fit via certior ultrà.

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The Editor thanks those Societies and individuals who have forwarded works and papers for the purposes of the Record, and suggests that Societies publishing Zoological Papers would much facilitate the work of the Recorders by forwarding a separate copy of each Zoological Memoir they publish to the Editor for the use of the Recorder. This is preferable to sending the entire volume, because each paper can go directly to the Recorder it concerns.

CAMBRIDGE:

PRINTED BY J. AND C. F. CLAY,
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PREFACE.



THIS volume includes the literature of the Cœlenterata for two years, and brings the indexing of all the branches of Zoological literature up to date. The last volume contained no Cœlenterata, but was swollen by a two years' record of the Echinoderma. The two volumes are very similar in extent, and it would appear that the literature of 1898 is quite as considerable as that of 1897. The number of new generic names is almost the same in both years.

Owing to the punctuality with which the various Records have been sent in, the volume appears at about the usual time. If similar promptness had been displayed in the correction of proofs it might have been published some weeks earlier.

D. SHARP.

CAMBRIDGE,

October 21st, 1899.

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ALPHABETICAL LIST
OF THE
ABBREVIATIONS
USED IN THE
ZOOLOGICAL RECORD, Vol. XXXV, 1898,
FOR THE
TITLES OF THE JOURNALS, TRANSACTIONS, ETC.
THAT CONTAIN ZOOLOGICAL PAPERS ;
WITH INDICATIONS OF SOME OF THE PRINCIPAL
LIBRARIES
IN WHICH THE BOOKS ARE CURRENT.

THE primary object of this list is to enable those using the Record to find with ease the full title of a Journal they see quoted in an abbreviated form. The arrangement is therefore a simple alphabetical list of the abbreviations, uncomplicated by syllabic or verbal limitations.

The list has also to serve the Recorders and others as a list of Journals, and for this purpose it is important that it should be fairly complete as regards current periodicals. In order to increase the utility of the list, the abbreviations have been made on a uniform system ; but a few exceptions have, in practice, been found necessary. The chief points that have been kept in view in constructing the abbreviations may be briefly stated as follows :—

The words selected as distinctive in each title are reduced in most cases to three or four.

A distinct abbreviation is used for each different word, and the same abbreviation for the same word is used throughout the list.

Accents are omitted. As a rule the first word of the title is represented by an abbreviation, but this rule is departed from in the case of articles and prepositions, and occasionally in the case of adjectives that are useless for distinctive purposes. Thus "Annual Report" becomes "Rep.," and "Occasional Papers" becomes "Pap." Such adjectives as "New" and "Royal" are omitted, except when necessary for distinctive or other purposes.

The consecutive order of the words of the title is maintained in the abbreviation, except in a few cases where the arrangement of the words in the title is very unusual or faulty.

As an example of the form of abbreviation that is aimed at, we may take Bull. Soc. Moscou. The name of the locality is given at greater length than the more frequently used portions of the abbreviation.

After the titles, the place of publication is given, and this is followed by letters indicating some of the principal libraries in which the works may be consulted. The explanation of these letters is as follows:—

- N. = British Museum Natural History: general library.
 Nz. = " " library, zoological department.
 Ng. = " " geological " "
 K. = Science library; South Kensington Museum.
 R. = Royal Society library.
 Z. = Zoological Society library.
 L. = Linnean
 C. = Cambridge University library.
 C, p or (C) p = Cambridge Philosophical Society library.
 b, or g, or y, after C, or (C) = Cambridge Balfour, or Woodwardian Museum, or Physiological libraries respectively.
 O. = Radcliffe library, Oxford.
 § is appended to titles added since the last list.

- Abeille*—L'Abeille: Journal d'entomologie publié par la Société entomologique de France. (Paris, 8vo.) Nz.
Abh. Ak. Berlin—Abhandlungen der königlichen Akademie der Wissenschaften zu Berlin. (Berlin, 4to.) N. K. R. Z. L. C, p. O.
Abh. Bayer. Ak.—Abhandlungen der mathematisch-physikalischen Classe der königlichen Bayerischen Akademie der Wissenschaften. (München, 4to.) N. K. R. Z. L. C, p. O.
Abh. Böhmisch. Ges.—Abhandlungen der mathematisch-naturwissenschaftlichen Classe der k. Böhmisches Gesellschaft. [Called also] Rozprawy trůdy mathematicko-přirodvěcke královské Ceske společnosti Nauk. (Prag, 4to.) N. K. R. L. C, p.
Abh. Deutsch. Seefisch.-Ver.—Abhandlungen des deutschen Seefischerei-Vereins. (Berlin, 4to.) § Nz. C.
Abh. geol. Karte Elsass—Abhandlungen zur geologischen Spezial-Karte von Elsass-Lothringen. (Strassburg, 8vo.) Ng.
Abh. geol. Landesanst. Darmstadt—Abhandlungen der grossherzoglich Hessischen geologischen Landesanstalt zu Darmstadt. (Darmstadt, 8vo.) Ng.
Abh. geol. Reichsanst.—Abhandlungen der Kaiserlich-Königlichen geologischen Reichsanstalt. (Vienna, 4to.) Ng. R. L. C, p.
Abh. Ges. Górlitz—Abhandlungen der naturforschenden Gesellschaft zu Górlitz. (Górlitz, 8vo.) N. K. R.
Abh. Ges. Góttling.—Abhandlungen der königlichen Gesellschaft der Wissenschaften zu Góttlingen. (Góttlingen, 4to.) N. R. Z. L. C, p. O.
Abh. Ges. Halle—Abhandlungen der naturforschenden Gesellschaft zu Halle. (Halle, 4to.) N. K. R. Z. L. C. O.
Abh. Ges. Isis—Sitzungsberichte und Abhandlungen der naturwissenschaftlichen Gesellschaft 'Isis' in Dresden. (Dresden, 8vo.) N. K. Z. C.
Abh. Ges. Königsb.—[Part of *Schr. Ges. Königsb.*, q.v.]

- Abh. Ges. Nurnberg*—Abhandlungen der naturhistorischen Gesellschaft zu Nürnberg. (Nürnberg, 8vo.) N. K. C.
- Abh. Ges. Wien*—[Part of *Verh. Ges. Wien*, q.v.]
- Abh. Hamburg. Anst.*—[Part of *Jahrb. Hamburg. Anst.*, q.v.]
- Abh. Mus. Dresden*—Abhandlungen und Berichte des königlichen zoologischen und anthropologisch-ethnographischen Museums zu Dresden. (Berlin, 4to.) N. Z. C.
- Abh. Preuss. geol. Landesanst.*—Abhandlungen der königlich Preussischen geologischen Landesanstalt (Neue Folge). [Formerly *Abh. geol. Spezialkarte von Preussen und den Thüringischen Staaten.*] (Berlin, 8vo.) Ng. K. C.
- Abh. Sachs. Ges.*—Abhandlungen der k. Sächsischen Gesellschaft der Wissenschaften. (Leipzig, 4to.) N. K. R. C, p.
- Abh. Schweiz. pal. Ges.*—Abhandlungen der Schweizerischen paläontologischen Gesellschaft. *Mémoires de la Société Paléontologique suisse.* (Basel, &c., 4to.) Ng. R. Z. (C) g. O.
- Abh. Senckenb. Ges.*—Abhandlungen herausgegeben von der Senckenbergischen naturforschenden Gesellschaft. (Frankfort a.-M., 4to.) N. K. R. Z. L. C. O.
- Abh. Ver. Bremen*—Abhandlungen herausgegeben vom naturwissenschaftlichen Verein zu Bremen. (Bremen, 8vo.) N. K. R. Z. L. C.
- Abh. Ver. Hamburg*—Abhandlungen aus dem Gebiete der Naturwissenschaften herausgegeben vom naturwissenschaftlichen Verein in Hamburg. (Hamburg, 4to.) N. K. R. Z. L. C, b.
- Abh. Ver. Karlsruhe*—[Vide *Verh. Ver. Karlsruhe.*]
- Abh. Ver. Kassel*—[Issued with *Ber. Ver. Kassel*, q.v.]
- Abh. Ver. Lotos*—Abhandlungen des deutschen naturwissenschaftlich-medicinischen Vereines für Böhmen "Lotos." (Prag, 4to.) § N.
- Acta Ac. German.*—N. *Acta Academiae Cæsareæ Leopoldino-Carolinæ Germanicæ naturæ curiosorum.* [Called also] *Verhandlungen der k. Leop.-Carol. deutschen Akademie der Naturforscher.* (Halle, 4to.) N. K. R. Z. L. C, p. O.
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- Acta Soc. Sci. Fenn.*—*Acta Societatis Scientiarum Fennicæ.* (Helsingfors, 4to.) N. K. R. Z. (C) p.
- Acta Soc. Upsal.*—*Nova Acta regiae Societatis Scientiarum Upsaliensis.* (Upsala, 4to.) N. K. R. Z. L. C, p.
- Acta Univ. Lund.*—*Acta Universitatis Lundensis.* [Called also] *Lunds Universitets Årsskrift*, [and includes] *Acta regiae Societatis physiographicæ Lundensis*, [also called] *Kongl. fysiografiska Sällskapets i Lund Handlingar.* (Lund, 4to.) N. K. R. L. C, p.
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- Act. Soc. Chili*—*Actes de la Société scientifique du Chili.* (Santiago, 4to.) R. Z.

- Act. Soc. Espan.*—Actas de la Sociedad española de historia natural. (Madrid, 8vo.) N. R. Z. C.
- Act. Soc. Helvet.*—Actes de la Société Helvétique des Sciences naturelles. [Called also] Verhandlungen der schweizerischen naturforschenden Gesellschaft. (Basel, &c., 8vo.) N. K. R. L. C. O.
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THE ZOOLOGICAL RECORD

FOR 1898.

I. GENERAL SUBJECTS.*

BY

Prof. J. ARTHUR THOMSON, M.A.

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I.—LIST OF TITLES.†

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* It will be understood that papers recorded here may also be found under the various classes, II—XVIII. They are included here because of their bearing on general questions, which, if not obvious, will be made apparent in the Subject-Index.

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II.—SUBJECT-INDEX.

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II. MAMMALIA.

BY

R. LYDEKKER.

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INTRODUCTION.

By far the most interesting points to which the Recorder has to draw attention are the discovery of the skin of a presumed survivor of the Plistocene Ground-Sloths (*Neomylodon*) in Patagonia, and of a representative of the Scaly-tailed Squirrels (*Anomaluridae*) in West Africa unprovided with a flying membrane. By a somewhat remarkable coincidence, the latter animal was discovered and described respectively by German and English explorers and naturalists almost simultaneously; and of the two generic names proposed, *Zenkerella* has the right of priority. Although, compared to the above of minor importance, the full description of the second species of *Rhinopithecus* is of much interest.

A notable feature of the year's work is the application of the American methods of investigation to the Mammals of the Old World; and the consequent description of local races or species distinguished largely or entirely by colour or size. Since a portion of this work has been undertaken by American naturalists, English workers are better enabled to judge of the nature of the characters on which local forms are regarded as entitled to distinction in America.

A problem of the greatest interest has arisen in South America owing to ROTH's asserted association of remains of Mammals with those of Dinosaurs. The Mammals being of an apparently advanced type, it has to be determined whether such could have existed in the Cretaceous, or whether it is a case of the survival of the Dinosaurs well into the Tertiary.

Attention may be specially directed to GREVÉ's valuable memoir on the distribution of the Ungulates. Highly important is DEPENDORF's treatise on the dentition of Marsupials; as are likewise RÖMER's investigations on the Monotreme integument. Mention may also be made of ASSHETON's communication on the development of the Pig, as well as of ACKERMAN's list of all known instances of hybridism in the class.

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- Sigmodon sanctæmartæ*, P. Soc. Washington, xii, p. 189, Colombia, *hispidus spadicipygus*, P. Boston Soc. xxviii, p. 192, Florida, BANGS, n. sp. & subsp.
- Rhithrodontomys leontii impiger*, W. Virginia, BANGS, P. Soc. Washington, xii, p. 167, n. subsp.
- Oryzomys antillarum*, i, p. 177, Jamaica, *victus*, p. 178, St Vincent, *chapmani*, p. 180, Mexico, *vestitus*, p. 454, Venezuela, *dryas*, ii, p. 267, Ecuador, *dryas humilior*, p. 268, Bogota, *flavicans*, p. 268, W. Cundinamarca, THOMAS, Ann. Nat. Hist. (7); *palustris coloratus*, BANGS, P. Boston Soc. xxviii, p. 189, Florida, *flavicans illectus*, P. Soc. Washington, xii, p. 164, Colombia; *nelsoni*, MERRIAM, t. c. p. 15, Tres Marias Ids, Mexico: n. spp. & subsp.; *palustris* in S. New Jersey, STONE, P. Ac. Philadelphia, 1898, p. 480.
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- Acodon berlepschii*, i, p. 281, Bolivia, *lenguarum*, ii, p. 271, Paraguay, THOMAS, Ann. Nat. Hist. (7), n. spp.
- Hesperomys* (*Acodon*) *michaëlseni*, S. Patagonia, MATSCHIE, Hamburger Magalhænsische Sammelreise—Säugeth. p. 5, pl. i, n. sp.
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- Neotoma fuscipes annectans*, p. 201, San Bernadine Co., *f. affinis*, p. 202, Santa Clara Co., ELLIOT, Publ. Columbian Mus. i; *floridana rubida*, BANGS, P. Boston Soc. xxviii, p. 185: n. subsp.
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- †*Siphneus arvicolinus*, described and figured, LOCZY, (147) p. 17, pl. xi, fig. 2.
- Chinchillula*, n. g., for *C. sahamæ*, Bolivia, THOMAS, Ann. Nat. Hist. (7) i, p. 280, n. sp.
- Zygodontomys brunneus*, W. Cundinamarca, THOMAS, *op. cit.* ii, p. 269, n. sp.
- Podanomalus*, n. g., for *Hapalotis longicaudatus*, Gould, 1844, WAITE, P. R. Soc. Victoria (2) x, p. 117.
- Thylacomys*, n. g., for *Hapalotis cervinus*, Gould, 1851, WAITE, *t. c.* p. 121.

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- Spalax*, notes on, SB. Ges. naturf. Berlin, 1898, p. 1, *græcus*, p. 228, Greece, *hungaricus*, p. 479, Hungary, n. spp., Zool. Anz. xxi, NEHRING.
- †*Alactaga saliens fossilis*, note on, NEHRING, N. Jahrb. Min. 1898, ii, p. 1; *A. elater*, Licht., from Transcaucasia, and not Transcaspia, NEHRING, SB. Ges. naturf. Berlin, 1898, p. 22.
- Zapus alleni*, Alpine Co., ELLIOT, Publ. Columbian Mus. i, p. 212, n. sp.

GEOMYIDÆ and HETEROMYIDÆ.

- Geomys floridanus austrinus*, p. 177, Florida, *colonus*, p. 178, Georgia, *cumberlandius*, p. 180, Cumberland Id, Georgia, BANGS, P. Boston Soc. xxviii, n. subsp. and spp.
- Perognathus pacificus*, p. 299, San Diego, *longimembris bangsi*, p. 300, Colorado Desert, California, *eremicus*, p. 300, Texas, MEARNs, Bull. Amer. Mus. x, n. spp. and subsp.
- Georychus lugardi*, Mashonaland, DE WINTON, Ann. Nat. Hist. (7) i, p. 253, n. sp.

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- Pedetes caffer*, anatomy, PARSONS, P. Zool. Soc. London, 1898, p. 858.
- †*Hystrix etrusca*, Pliocene, Tuscany, Bosco, Palæont. Ital. iv, p. 141, n. sp.

Trichys guentheri, affinities, etc., CEDERBLOM, Zool. Jahrb. Syst. xi, p. 497.

Echimys chrysæolus, Bogota, THOMAS, Ann. Nat. Hist. (7) i, p. 244, n. sp.

Ctenomys talarum, La Plata, THOMAS, *t. c.* p. 285, n. sp.

DASYPROCTIDÆ and CAVIIDÆ.

Dasyprocta rubrata, p. 273, Trinidad, *rubrata flavescens*, p. 274, Venezuela, THOMAS, Ann. Nat. Hist. (7) ii; *colombiana*, BANGS, P. Soc. Washington, xii, p. 163, Colombia: n. spp. & subsp.

Cavia niata, p. 282, Bolivia, *manas*, p. 284, Rioja, Argentina, THOMAS, Ann. Nat. Hist. (7) i, n. spp.

† *Megastus*, n. g., for *M. elongatus*, Tertiary, Patagonia, ROTH, Rev. Mus. La Plata, ix, p. 53, n. sp.

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Dolichotis salinicola, Burm. valid, BERG, Com. Mus. Buenos Aires, i, pp. 23 & 44; denied by ST LOUP, *t. c.* p. 43.

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Lepus europæus, introduction into Ireland, BARRETT-HAMILTON, Irish Natural. 1898, p. 69; *europæus occidentalis*, p. 152, Britain, *lilfordi*, p. 153, Spain, *corsicanus*, p. 155, Corsica, *kabylicus*, p. 155, Algeria, *tunetis*, p. 157, Tunisia, DE WINTON, Ann. Nat. Hist. (7) i; *americanus struthropus*, BANGS, p. 81, Nova Scotia, *margaritæ*, p. 97, Margarita Id, Venezuela, MILLER, P. Soc. Washington, xii; *californicus xanti*, THOMAS, Ann. Nat. Hist. (7) i, p. 45, Low. California, *pallidior*, BARRETT-HAMILTON, *ibid.* ii, p. 422, Algeria; n. spp. & subspp.; *cuniculus*, orbital glands, LOR, J. Anat. Physiol. xxxiv, p. 463, *oiostolus*, note on, BLANFORD, P. Zool. Soc. London, 1898, p. 357.

VI. UNGULATA.

ARTIODACTYLA.

Homology of cranial appendages, NITSCHKE, Studien über Hirsche; geographical distribution, GREVÉ, Acta Ac. German. lxx, p. 289.

Artiodactyla of Uinta beds, SCOTT, P. Amer. Phil. Soc. xxxvii, p. 73.

BOVIDÆ.

Nyasaland Antelopes, habits of, RENDALL, Nov. Zool. v, p. 207; Gambian do., SCLATER, P. Zool. Soc. London, 1898, p. 249; *Bos* (with subgenera), *Ovibos*, *Ovis*, *Capra* and *Hemitragus*, monograph of, LYDEKKER, Wild Oxen, Sheep, and Goats of all Lands; *Bovidæ* of Central Asia, POUSARGUES, Mem. Soc. Zool. Paris, xi, p. 126.

† *Bos arizonicus*, BLAKE, Amer. Geol. xxii, p. 65, Plistocene, Arizona, † *brachyceros europæus*, ADAMETZ, Bull. Ac. Cracovie, 1898, p. 88, Plistocene, Poland, *sondaicus birmanicus*, LYDEKKER, P. Zool. Soc. London, 1898, p. 276, pl. xxv, Burma, *bubalis hosei*, LYDEKKER, Wild Oxen, Sheep, and Goats, p. 126, Borneo, n. sp. & subspp.; *gaurus* and *sondaicus*, note on, POLLOK, Zoologist (4) ii, p. 1; *taurus*, British park breeds, WALLACE, Tr. Soc. Glasgow (2) v, p. 220; *priscus* in Switzerland, KELLER, Mt. Ges. Luzern, 1895-96, p. 181.

- †*Bison occidentalis*, Pliocene, Kansas and Alaska, LUCAS, Science (2) viii, p. 678, n. sp.
- Ovis sairensis*, Sair Mts. p. 185, *canadensis liardensis*, p. 215, Liard R., LYDEKKER, Wild Oxen, Sheep, and Goats, n. sp. and subsp.; *poli*, distribution and habits, LANGKAVEL, Zool. Garten, xxxix, pp. 67 & 174.
- Capra hircus blythi*, p. 264, Sind, *falconeri cashmiriensis*, p. 290, Pir Panjal, †*falconeri punjabiensis*, p. 259, Siwaliks, LYDEKKER, Wild Oxen, Sheep, and Goats, n. subsp.
- Nemorhædus* (= *Capricornis*), Tibetan forms, HEUDE, Mem. Hist. Emp. Chinois, iv, p. 1; many new species' names given.
- Budorcas*, affinities, MATSCHIE, SB. Ger. naturf. Berlin, 1898, p. 30.
- Hippotragus equinus* and *bakeri*, note on, DE WINTON, P. Zool. Soc. London, 1898, p. 127; *rufopallidus*, NEUMANN, t. c. p. 850, E. Africa; *langheldi*, MATSCHIE, SB. Ges. naturf. Berlin, 1898, p. 182, German E. Africa: n. spp.
- Gazella*, the species monographed, SCLATER & THOMAS, Book of Antelopes, pts. x-xii.
- Saiga tatarica*, distribution, GREVÉ, KB. Ver. Riga, xl, p. 109; †*prisca*, HIBSCH, N. Jahrb. Min. 1898, i, p. 60.
- Dorcotragus megalotis*, habits, COX, J. Bombay Soc. xi, p. 725.
- Madoqua cavendishi*, N. E. Africa, THOMAS, P. Zool. Soc. London, 1898, p. 278, n. sp.
- Nesotragus livingstonianus zuluensis*, Zululand, THOMAS, Ann. Nat. Hist. (7) ii, p. 317, n. subsp.
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GIRAFFIDÆ and CERVIDÆ.

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- LYDEKKER (153) monographs in popular style the living and some of the extinct species of Deer; the name *Anoglohis*, Cr. & Job., is adopted for *Cervus sedgwicki* and its allies, and *Mazama*, Rafinesque, for the American deer; *Cervidæ* of Central Asia, POUSARGUES, Mem. Soc. Zool. Paris, xi, p. 126; antlers, their homology and abnormalities, NITSCHKE, Studien über Hirsche.
- Alces machlis*, distribution, GREVÉ, Zool. Garten, xxxix, p. 300.
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- Cervus* (*Pseudaxis*) *sica* and allies, notes on, HEUDE, Mem. Hist. Nat. Emp. Chinois, iv, p. 92; many new species' names proposed.
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- Capreolus vulgaris*, antlers, HENNICKE, Zool. Garten, xxxix, p. 361.
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- Odocoileus*, Rafinesque, 1832, antedates *Dorcelaphus*, Gloger, 1841, MERRIAM, P. Soc. Washington, xii, p. 99. *O. columbianus sitkensis*, p. 100, Alaska, c. *scaphiotus*, p. 101, California, *cerrosensis*, p. 101, Cerros Id., California, *thomasi*, p. 102, Mexico, *nelsoni*, p. 103, Mexico, MERRIAM,

- t. c.*, n. spp. & subsp. *Mazama truei*, LYDEKKER, *Deer of All Lands*, p. 268 (= *Odocoileus truei*, Merriam, *op. cit.* p. 103, *Cariacus truei*, TROUESSART, *Cat. Mamm.* p. 895), to replace *Cariacus clavatus*, True, 1888, nec *Cervus clavatus*, H. Smith, 1827; *Dorcelaphus texanus*, Texas, MEARN, P. Soc. Washington, xii, p. 23, n. sp.
Mazama hemionus peninsulæ, S. California, LYDEKKER, P. Zool. Soc. London, 1898, p. 900, & *Deer of All Lands*, p. 276, n. subsp.

CAMELIDÆ.

- American extinct, WORTMAN, *Bull. Amer. Mus.* x, p. 93; Central Asian, POUSARGUES, *Mem. Soc. Zool. Paris*, xi, p. 126.
 †*Protylopus*, n. g., for *P. petersoni*, Uinta beds, WORTMAN, *t. c.* p. 104, n. sp.
 †*Gompothorium cameloides*, John Day beds, WORTMAN, *t. c.* p. 117, n. sp.
 †*Pliauchenia minima*, Loup Fork beds, WORTMAN, *t. c.* p. 127, n. sp.
Camelus (†) *americanus*, Pliocene, N. America, WORTMAN *t. c.* p. 133, n. sp.

†EXTINCT FAMILIES.

- Leptoreodon*, n. g., for *L. marshi*, Uinta beds, WORTMAN, *Bull. Amer. Mus.* x, p. 93, n. sp.
Merycodesmus, p. 75, n. g., for *M. gracilis*, p. 76, Uinta beds, SCOTT, P. Amer. Phil. Soc. xxxvii, n. sp.
Camelomeryx, n. g., p. 77, for *C. longiceps*, p. 78, *ibid.*, SCOTT, *t. c.*, n. sp.
Agriotherium, n. g., p. 79, for *A. paradoxicum*, p. 80, *ibid.*, SCOTT, *t. c.*, n. sp.
 Structure of skull of *Dichodontidæ*, EARLE, *Amer. Natural.* xxxii, p. 117.
 †*Bunomeryx*, n. g. (*Cænotheriidæ*), for *B. montanus*, WORTMAN, *Bull. Amer. Mus.* x, p. 97, *B. elegans*, *t. c.* p. 100, Uinta beds; n. spp.
Ancodus aymardi (*Anthracotheiidæ*) from Italy, BOFILL, *Bol. Ac. Barcelona* (3) i, p. 332.
Elotherium, osteology, SCOTT, *Tr. Amer. Phil. Soc.* (2) xix, p. 273.

DICOTYLIDÆ.

- Tagassu torvus*, Colombia, BANGS, P. Soc. Washington, xii, p. 164, n. sp.

PERISSODACTYLA.

- Relations of American and European Tapiroids and Lophiodonts, EARLE, *Amer. Natural.* xxxi, p. 115.
 Osteology and affinities of recent and fossil Rhinoceroses, Amynodonts, and Hyracodonts, OSBORN, *Mem. Amer. Mus.* i, p. 75.
 †*Teleoceras fossilis*, osteology, OSBORN, *Bull. Amer. Mus.* iv, p. 51.
 †*Isectolophus ruetimeyeri*, TROUESSART, *Cat. Mamm.* p. 765, for *I. annectans*, Rüt. 1891, nec Scott & Osborn, 1887, n. sp.
 †*Protapirus filholi*, TROUESSART, *loc. cit.* for *Tapirus priscus*, Filhol, 1877, nec Kaup, 1833.
 Colour of ancestral type of *Equidæ*, DECHAMBRE, *Rev. Scient.* (4) ix, p. 713; cross-breeding, EWART, *Zoologist* (4) ii, p. 49.
 Development of monodactylism in *Equidæ*, JOLY, *CR. Ac. Sci.* cxxvi, p. 1579.
Equus burchelli transvaalensis, EWART, *Veterinarian*, 1897, p. 622, Transvaal, *b. zambesiensis*, TROUESSART, *Bull. Mus. Paris*, 1898, p. 46, Zambesia, *hartmannæ*, MATSCHIE, *SB. Ges. naturf. Berlin*, 1898, p. 174, German S.E. Africa, n. sp. & subsp.; *b. boehmi*, note on, DE WINTON,

P. Zool. Soc. London, 1898, p. 3; *caballus* and *asinus*, skulls compared, DUGES, Act. Soc. Chile, viii, p. 77; *caballus*, fossil phalange, PADER, Bull. Soc. Nimes, 1898, p. 6, polydactylism in, BRIOT, C.R. Soc. Biol. (10) v, p. 460.

HYRACOIDEA, †TOXODONTIA and †LITOPTERNA.

Jacobson's organ in *Procavia*, BROOM, J. Anat. Physiol. norm. path. xxxii, p. 709; habits of, *P. capensis*, EISMANN, Zool. Garten, xxxix, p. 118. Arrangement of hairs and nails in embryo of *P. syriaca*, NASONOFF (186A).

†*Toxodon*, monograph of, ROTH, Cat. Mus. La Plata, p. 1.

†*Hegetotherium andinum*, Tertiary, Patagonia, ROTH, Rev. Mus. La Plata, ix, p. 34, n. sp.

†*Propachyrucos*, n. g., p. 36, for *P. depressus*, *medianus*, p. 37, *robustus*, p. 38, ROTH, t. c., *ibid.*, n. spp.

†*Icochilus endiadys*, *ibid.*, ROTH, t. c. p. 38, n. sp.

†*Nesciotherium*, n. g., for *N. indiculus*, *ibid.*, ROTH, t. c. p. 41, n. sp.

†*Nesodonopsis*, n. g., p. 41, for *N. burckhardti*, p. 43, *deformis*, p. 47, *ibid.*, ROTH, t. c., n. spp.; *Stenostephanus speciosus* (Lyd.) referred to same genus.

†*Eutrachytherus modestus*, *ibid.*, ROTH, t. c. p. 48, n. sp.

†*Palyeidodon*, n. g., for *P. obtusum*, *ibid.*, ROTH, t. c. p. 49, n. sp.

†ASTRAPOTHEROIDEA.

Monoeidodon, n. g., for *M. primum*, Tertiary, Patagonia, ROTH, Rev. Mus. La Plata, ix, p. 51, n. sp.

Diadiaphorus minusculus, *ibid.*, ROTH, t. c. p. 52, n. sp.

†AMBLYPODA and CONDYLRARTHRA.

Evolution, osteology, etc. of *Amblypoda*, OSBORN, Bull. Amer. Mus. x, p. 169.

Coryphodon ventanus, p. 210, *wortmani*, p. 212, *singularis*, p. 214, Tertiary, N. America, OSBORN, t. c., n. spp.; *radians*, note on, OSBORN, t. c. p. 81.

Syncodon, n. g., for *S. sericeuspis*, Laramie, OSBORN, t. c. p. 171, n. sp.

Ectoconodon, n. g., for *E. petersoni*, *ibid.*, OSBORN, t. c., n. sp.

Protolambda, n. g., for *P. hatcheri*, *ibid.*, OSBORN, t. c. p. 172, n. sp.

Phenacodus, osteology, OSBORN, t. c. p. 159.

PROBOSCIDEA.

Remains from Hudson Bay, BELL, Bull. U. S. Geol. Soc. ix, p. 369; from Hungary, Gyula, Fold. Kozlony, 1898, p. 291; from Turin, PORTIS, Bol. Soc. Geol. Ital. xvii, p. 94.

†*Elephas primigenius*, its ivory in Siberia, TROUESSART, Rev. Sci. nat. appl. 1898, p. 41; *africanus*, domestication, BOUDARIC, C.R. Ass. France, 1897, p. 564; hunting, NEUMANN (211).

†*Elephas* (*Stegodon*) *insignis*, molar from Central Asia described and figured by LÖCZY, (147), p. 14, pl. xi.

VII. CETACEA and SIRENIA.

Cetacea of Scotch coast, TAYLOR (283); of N. America, SHUFELDT (271A); form compared with that of fishes, THILO, KB. Ver. Riga, xl. p. 138; urino-genital organs, DAUDT, Jena. Zeit. xxxii, p. 231; stomach, JUNGKLAUS, t. c. p. 1; Whaling, SOUTHWELL, Zoologist (4) ii, p. 69.

TRUE, P. U. S. Mus. xxi, p. 635, considers that the following names are entitled to stand, viz:—

Balæna mysticetus, Linn. = Greenland Right-Whale.

„ *glacialis*, Bonnat. = Southern Right-Whale.

Balænoptera physalus (Linn.) = Common Rorqual.

„ *musculus* (Linn.) = Sibbald's „

„ *borealis*, Lesson. = Rudolphi's „

„ *acuto-rostrata*, Lacep. = Least „

Megaptera longimana (Rudolphi). Humpback.

Balæna mysticetus, migration and distribution, SOUTHWELL, Nat. Science, xii, p. 397.

†*Cetotherium parvum*, TROUESSART, Cat. Mamm. p. 1071, for *C. pusillum*, Cope, 1868, nec Nordmann, 1860.

†*Pristinocetus*, n. g., TROUESSART, loc. cit. for *Delphinapterus nordmanni*, Brandt, 1873.

Delphinus and *Tursiops*, stomach, CATTANEO, Atti Soc. Ligust. ix, p. 452.

Phocæna communis, intestinal villi, SCHIRMAN, Verh. Ges. Würzburg, xxxii, art. 1; dentition, ADLOFF, Anat. Anz. xv, p. 2.

†*Champsodelphis* from Sarmatia, TOULA, N. Jahrb. Min. 1898, i, p. 64.

Halicore, manus, ANDERSON, J. Anat. Physiol. norm. path. xxxii, p. 765.

VIII. EDENTATA and EFFODIENTIA.

†*Elipsodon*, n. g. (*Megalotheriidae*), for *E. heimi*, Tertiary, Patagonia, ROTH, Rev. Mus. La Plata, ix, p. 54, n. sp.

†*Neomylodon listai* [*listæ*, R. L.], AMEGHINO (13), Patagonia.

†*Propalæohoplophorus informis*, Tertiary, Patagonia, ROTH, Rev. Mus. La Plata, ix, p. 55, n. sp.

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†*Polymorphis*, n. g., for *P. leckei*, *ibid.*, ROTH, t. c. p. 385, n. sp.

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†*Heteroglyphis*, n. g., for *H. dewoletzky*, *ibid.*, ROTH, t. c. p. 387, n. sp.

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†*Rhyphodon*, n. g., for *R. lankesteri*, *ibid.*, ROTH, t. c. p. 388, n. sp.

III. AVES.

BY

R. BOWDLER SHARPE, LL.D., &c.

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INTRODUCTION.

THE chief event of the year 1898 has been the completion of the British Museum 'Catalogue of Birds'; and the year has also been remarkable for the discovery of many fine new species especially from the mountainous parts of the Malayan Islands.

One of the most important works issued during the twelve months is certainly that on the Avifauna of Celebes by Dr A. B. Meyer and Mr L. W. Wiglesworth.

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- P. rubra*, note on; A. L. LETACQ, Bull. Soc. Rouen, xxiii, pp. 28–32.
- Francolinus lorti*, figured; E. LORT PHILLIPS, Ibis, 1898, pl. x.
- Pternistes nudicollis melanogaster*, n. subsp., Usambara, East Africa; O. NEUMANN, J. Ornith. 1898, pp. 299–301, Taf. iii, fig. 1. *P. humboldti*, figured; *id. t. c.* Taf. iii, fig. 2. *P. leucopareus*, figured; *id. t. c.* Taf. iii, fig. 3. *P. nudicollis*, figured; *id. t. c.* Taf. iii, fig. 4.
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- Gennæus williamsi*, n. sp., Upper Burma; E. W. OATES, Man. Game-birds of India, i, pp. 342–344. *G. sharpii*, n. sp., Hills between Burma and Siam; *id. t. c.* pp. 357–361. *G. rufipes*, n. sp., Ruby-Mines district, Burmah; *id. t. c.* pp. 362 & 363.
- Lophura nobilis*, notes on; A. G. VORDERMAN, Nat. Tijds. Nederl. Indië, lviii, Af. 2.
- Guttera*. Notes on the genus; A. REICHENOW, Ornith. Monber. vi, pp. 1–3.
- G. sclateri*, n. sp., Cameroons; *id. t. c.* p. 115.
- Numida*. Notes on the species; O. NEUMANN, Ornith. Monber. vi, pp. 17–22. *N. cornuta*, F. & H. = *N. coronata*, Gray. *N. marungensis maxima*, n. subsp., Benguela. *N. marungensis intermedia*, n. subsp., W. of Victoria Nyanza; *id. t. c.* p. 21.
- Dactylortyx*: Review of the genus; E. W. NELSON, P. Soc. Washington, xii, pp. 64–68. *D. chiapensis*, n. sp., Chiapas, Mexico; *id. t. c.* p. 66. *D. devius*, n. sp., W. Mexico; *id. t. c.* p. 68.
- Odontophorus parambæ*, figured; E. HARTERT, Nov. Zool. v, p. 505, pl. iii, fig. 1.
- Turnix everetti*, n. sp., Sumba Is.; E. HARTERT, Nov. Zool. v, p. 476.
- Colinus*, notes on the species of the genus in Mexico; E. W. NELSON, Auk, xv, pp. 115–122: *C. godmani*, figured; *id. t. c.* pl. ii.
- Excalfactoria chinensis*, notes on the nesting; D. SETH-SMITH, Avicult. Mag. iv, p. 200; A. G. BUTLER, *t. c.* pp. 211 & 212; E. G. B. MEADE-WALDO, *t. c.* v, pp. 1 & 2.
- Megapodius cumingi* (fig. 1), *M. sangirensis* (fig. 2), figured; A. B. MEYER & L. W. WIGLESWORTH, B. Celebes, ii, pl. xli.
- Talegallus purpureicollis*, n. sp., Cape York; D. LE SOUËF, Ibis, 1898, pp. 51 & 52.

Order PTEROCLETES.

See TEGETMEIER, W. B. (519).

Syrnhaptes tibetanus in High Tibet; P. L. SCLATER, Bull. B. O. C. vii, p. lvii.

Order COLUMBIFORMES.

- Carpophaga obiensis*, n. sp., Obi Major; E. HARTERT, Bull. B. O. C. vii, p. xxxv.
- C. concinna* (fig. 1), and *C. intermedia* (fig. 2), figured; A. B. MEYER & L. W. WIGLESWORTH, B. Celebes, ii, pl. xxxix. *C. pulchella*,

- Wald. = *C. paulina* (Bp.); E. HARTERT, Nov. Zool. v, p. 135. *C. pæcilorrhoea*, skeleton figured; A. B. MEYER, Vogel-Skel. Lief. xxiii, Taf. ccxxx.
- Reinwardtanus reinwardti obiensis*, n. subsp., Obi Major; E. HARTERT, Bull. B. O. C. vii, p. xxxv.
- Columba sjöstedti*, n. sp., Cameroons; A. REICHENOW, J. Ornith. 1898, p. 138.
- C. subvinacea berlepschi*, n. subsp., N.W. Ecuador; E. HARTERT, Nov. Zool. v, p. 504. *C. flavirostris madrensis*, n. subsp., Tres Marias Is.; E. W. NELSON, Proc. Soc. Washington, xii, p. 6. *C. meridionalis*, Lath. = *Zenaida zenaida*, pt. and *Z. auriculata*, pt.; H. O. FORBES & H. C. ROBINSON, Bull. Liverp. Mus. i, p. 36. *C. guinea uhehensis*, Uhehe, German East Africa; A. REICHENOW, Ornith. Monber. vi, p. 82.
- Hemiphaga spadicea*, Lath., notes on; H. O. FORBES & H. C. ROBINSON, Bull. Liverp. Mus. i, pp. 35 & 36.
- Ptilinopus mangoliensis*, n. sp., Sula Mangoli; W. ROTHSCILD, Bull. B. O. C. vii, p. xxxiv. *P. everetti*, n. sp., Alor; *id. t. c.* p. xxxiv. *P. granu-lifrons*, n. sp., Obi Major; *id. t. c.* p. xxxv.
- Phlegænas virgo*, Reichen. = *P. xanthonura*, Temm. (*P. pampusan* (Q. & G.) apud Salvad. Cat. B. xxi, p. 602); E. HARTERT, Nov. Zool. v, p. 61.
- Ptilopus melanocephalus* (fig. 1), *P. chrysorrhous* (fig. 2), and *P. xanthorrhous* (fig. 3), figured; A. B. MEYER & L. W. WIGLESWORTH, B. Celebes, ii, pl. xxxviii.
- P. (Leucotreron) alligator*, n. sp., North Australia; R. COLLETT, P. Zool. Soc. Lond. 1898, pp. 354 & 355, pl. xxix.
- Calænas maculata* (Lath.), notes on; H. O. FORBES, Bull. Liverp. Mus. i, p. 83, pl. i.
- Turturæna harterti*, n. sp., Kilima Ndscharo; O. NEUMANN, J. Ornith. 1898, pp. 287-289, Taf. 2.
- Macropygia albicapilla* ♂, ♀ et pull. figured; A. B. MEYER & L. W. WIGLESWORTH, B. Celebes, ii, pl. xl.
- Leptoptila capitalis*, n. sp., Tres Marias Is.; E. W. NELSON, Proc. Soc. Washington, xii, p. 6.
- Haplopelia larvata kilimensis*, n. subsp., Kilima Ndscharo; O. NEUMANN, J. Ornith. 1898, p. 289.
- Petrophassa rufipennis*, n. sp., North Australia; R. COLLETT, P. Zool. Soc. Lond. 1898, p. 354, pl. xxviii.
- Lophophaps ferruginea*, nest and eggs described; A. J. NORTH, P. Linn. Soc. N. S. Wales, xxiii, p. 382.
- Ectopistes migratoria* × *Turtur risorius*, in confinement; C. O. WHITMAN, Ibis, 1898, p. 311.
- Geotrygon veraguensis cachariensis*, n. subsp., N.W. Ecuador; E. HARTERT, Nov. Zool. v, p. 504.

Order RALLIFORMES.

- Hypotaenidia brachypus exsul*, n. subsp. Flores; E. HARTERT, Nov. Zool. v, p. 50. *H. jentinki*, Sharpe = *H. sulcirostris* (Wall.), from the Sula Is.; *id. t. c.* p. 136.
- Aramidopsis plateni*, figured; A. B. MEYER & L. W. WIGLESWORTH, B. Celebes, ii, pl. xlii, fig. 2.
- Ocydromus australis*, its eggs; F. A. BLAAUW, Bull. B. O. C. vii, p. xliii.
- Neocrex colombianus*, n. sp., Santa Marta, Colombia; O. BANGS, P. Soc. Washington, xii, p. 171.
- Ortygometra auricularis*, nom. emend. pro *O. intermedia* (Herman), *O. pusilla*, Auct. recent. (nec Pall.); A. REICHENOW, J. Ornith. 1898, p. 139.

- Porzana fusca*, in Negros, Philippines; W. EAGLE CLARKE, Ibis, 1898, p. 123. *P. maruetta*, in Co. Wexford; G. E. H. BARRETT-HAMILTON, Irish Natural. vii, p. 125: in Socotra; H. B. TRISTRAM, Ibis, 1898, pp. 148 & 149. *P. fluminea*, nest and eggs described; A. M. MORGAN, Tr. R. Soc. S. Australia, xxii, p. 193.
- Pennula wilsoni*, n. sp., ?; O. FINSCH, Notes Leyden Mus. xx, pp. 77-80.
- Gymnocrex rosenbergi*, figured; A. B. MEYER & L. W. WIGLESWORTH, B. Celebes, ii, pl. xlii, fig. 1.
- Amaurornis olivacea*, in Negros, Philippines; W. EAGLE CLARKE, Ibis, 1898, p. 123. *A. isabellina*, figured; A. B. MEYER & L. W. WIGLESWORTH, B. Celebes, ii, pl. xliii, fig. 2.
- Gallinula*, notes on the genus; E. HARTERT, Nov. Zool. v, pp. 62-64. *G. garmani* Allen, is a distinct race; *id. t. c.* p. 63. Heads of *G. galeata*, *G. sandwichensis* and *G. chloropus*, figured; *id. t. c.* p. 64. *G. chloropus*, in Negros, Philippines; W. EAGLE CLARKE, Ibis, 1898, p. 123; *G. chloropus*, mode of progression of the young on land; R. GODFREY, Ann. Scott. Nat. Hist. 1898, p. 183. *G. frontata*, figured; A. B. MEYER & L. W. WIGLESWORTH, B. Celebes, ii, pl. xliii, fig. 1; *G. frontata*, skeleton figured; A. B. MEYER, Vogel-Skel. Lief. xxiv, Taf. ccxxxvi.

Order COLYMBIFORMES.

See FORBES, H. O. (174).

- Catalogue of the *Pygopodes* in the collection of the British Museum; W. R. OGILVIE GRANT, Cat. B. Brit. Mus. xxvi, pp. 485-558.
- Notes on the terrestrial attitudes of the Loons; R. W. SHUFELDT, Ibis, 1898, pp. 46-51.
- Colymbus arcticus*, in East Renfrewshire; J. PATERSON & J. ROBERTSON, Ann. Scott. Nat. Hist. 1898, p. 115.

Order PODICIPEDIFORMES.

- Catalogue of the *Pygopodes* in the collection of the British Museum; W. R. OGILVIE GRANT, Cat. B. Brit. Mus. xxvi, pp. 485-558.
- Notes on the terrestrial attitudes of the Grebes; R. W. SHUFELDT, Ibis, 1898, pp. 46-51.
- Notes on various species of Grebes, with especial reference to the power of walking and digestion possessed by these birds; F. FINN, J. Asiat. Soc. Bengal, lxvi, pp. 725-730.
- Podiceps griseigena*, skeleton figured; A. B. MEYER, Vogel-Skel. Lief. xxiv, Taf. ccxxxviii.
- Tachybaptus capensis*, figured; W. R. O. GRANT, Cat. B. Brit. Mus. xxvi, pl. vii. *T. albipennis* (= *T. capensis*), figured, pl. viii.

Order SPHENISCIFORMES.

- Catalogue of the *Impennes* in the collection of the British Museum; W. R. OGILVIE GRANT, Cat. B. Brit. Mus. xxvi, pp. 623-653.
- Contributions to the osteology of the *Impennes*; W. P. PYCRAFT, P. Zool. Soc. London, 1898, pp. 958-989, pls. lix-lxi.
- *Penguins in the Macquarie Islands; W. H. BICKERTON, Pall Mall Magazine, Vol. xiii (November) p. 363.
- Penguins. The position assumed when walking; F. FINN, Ibis, 1898, pp. 175 & 176.
- Spheniscus magellanicus*, skull figured; W. P. PYCRAFT, P. Zool. Soc. London, 1898, pl. lix, fig. 1.
- Pygoscelis papua*, skull figured; *id. t. c.* pls. lix, fig. 2, lxi, figg. 2 & 3.

- Eudiptila albosignata*, skull figured; *id. t. c.* pls. lix, fig. 4, lx, fig. 1.
Catarrhactes chrysocome, skull figured; *id. t. c.* pls. lix, fig. 5, lx, fig. 2, lxi, figg. 1, 4, 5.
Megadyptes antipodum, skull figured; *id. t. c.* pl. lx, fig. 3.
Aptenodytes pennanti, notes on the moulting; W. E. DE WINTON, P. Zool. Soc. London, 1898, pp. 900–902. *A. patagonica*, skull figured; W. P. PYCRAFT, *t. c.* pl. lix, fig. 3.

Order PROCELLARIIFORMES.

See MACPHERSON, H. A. (308).

- Petrels of Southern California; A. W. ANTHONY, Auk, xv, pp. 140–144.
Oceanodroma castro (Harcourt), vice *O. cryptoleucura*, Ridgway; W. R. OGILVIE GRANT, Ibis, 1898, pp. 313 & 314. *O. melania*, *O. socorroensis*, *O. kaedingi*, notes on breeding; A. W. ANTHONY, Auk, xv, pp. 140–144. *O. furcata*, and *O. leucorrhoa*, notes on the nesting; J. MAILLIARD, *t. c.* pp. 230 & 233. *O. kaedingi*, n. sp., Socorro and Clarion Islands, Lower California; A. W. ANTHONY, *t. c.* pp. 37 & 38.
Puffinus maria, n. sp., Brava, Cape Verde Islands; B. ALEXANDER, Ibis, 1898, pp. 92 & 93. *P. tenuirostris*, notes on the habits; H. H. MONTGOMERY, Ibis, 1898, pp. 209–216. *P. assimilis* in Ireland; H. SAUNDERS, Bull. B. O. C. vii, p. xl. *P. cuneatus*, in Lower California; A. W. ANTHONY, Auk, xv, p. 39. *P. tenuirostris*, in California; J. MAILLIARD, Auk, xv, p. 197. *P. auricularis*, in Southern California; A. W. ANTHONY, Auk, xv, p. 38.
Procellaria glacialis, at St Kilda; H. EVANS, Ann. Scott. Nat. Hist. 1898, p. 238.
Diomedea platei, n. sp., Chile; A. REICHENOW, Ornith. Monber. vi, p. 190.
D. immutabilis, near Guadalupe Isl., Lower California; A. W. ANTHONY, Auk, xv, p. 38. *D. albatrus*, note on the egg; C. J. CAMPBELL, Victorian Naturalist, xiv, pp. 142 & 143.

Order ALCIFORMES.

See APLIN (21).

- Alca impennis*, notes on; DUCHAUSSOY, Mem. Soc. Nord France, ix, pp. 88–126, 241–251, pls. i & ii (photographic): GRIEVE, Tr. Edinb. Nat. & Micros. Soc. 1897–98, pp. 327–340: in the Orkneys; A. NEWTON, Ibis, 1898, pp. 587–592.
Plautus impennis, egg; H. NOBLE, Bull. B. O. C. vii, p. xlvii.
Brachyramphus marmoratus, notes on the egg; CANTWELL, Auk, xv, p. 49: egg described; RALPH, *t. c.* p. 49.

Order LARIFORMES.

See FORBES (175).

- The Terns of Great Gull Island, N. Y., during 1897; REED, Auk, xv, pp. 40–43.
The Terns of Muskeget Island, Massachusetts, pt. iv; MACKAY, *t. c.* pp. 168–172.
Gelastes genei [sc. *Larus gelastes*], near Venice, E. NINNI, Avicula, ii, pp. 98–101.
Gygis alba kittlitzi, Hartert, from the Marianne Is. distinct from *G. alba*; HARTERT, Nov. Zool. v, p. 67.
Sterna fluviatilis, skeleton figured; MEYER, Vogel-Skel. Lief. xxii, Taf. ccxviii. *S. caspia*, notes on its nesting-place; WÜSTNEI, Ornith. Monber. vi, pp. 72 & 73.

Anous stolidus ridgwayi, n. subsp., Cocos and Socorro Islands, Pacific Ocean; ANTHONY, Auk, xv, pp. 36 & 37.

Larus fuscus, nesting in Co. Kildare; PALMER, Irish Natural. vii, pp. 186 & 187. *L. ridibundus*, its migration in Tyrolese Highlands; THUN, Ornith. Jahrb. ix, p. 233. *L. melanocephalus* in Lower Austria; V. TSCHUSI ZU SCHMIDHOFFEN, Ornith. Jahrb. ix, pp. 70 & 71. *L. marinus*, skeleton figured; MEYER, Vogel-Skel. Lief. xxiv, Taf. ccxxxix: *L. ridibundus*, Taf. ccxl B. *L. audouini*, on the Island of Elba; G. DAMIANI, Avicula, ii, pp. 131-133.

Rhodostethia rosea, on Bering Island; STEJNEGER, Auk, xv, p. 183.

Pagophila eburnea, on Khabarova; POPHAM, Ibis, 1898, p. 459.

Order CHARADRIIFORMES.

Sub-order CHARADRII.

See SLATER (504).

Ædicnemus büttikoferi, n. sp., Liberia, REICHENOW, Ornith. Monber. vi, pp. 182 & 183.

Streptilas interpres, in Socotra; TRISTRAM, Ibis, 1898, pp. 148 & 149: in Franz Josef Land; CLARKE, Ibis, 1898, p. 259: on Waigats Island; POPHAM, Ibis, 1898, p. 459.

Vanellus vanellus, skeleton figured; MEYER, Vogel-Skel. Lief. xxiv, Taf. ccxla: its disappearance in North Lincolnshire; CORDEAUX, Zoologist, 1898, p. 272.

Ægialitis peroni, egg figured; GRANT & WHITEHEAD, Ibis, 1898, pl. vi, fig. 8.

Charadrius dominicus, 1897 migration in Massachusetts; MACKAY, Auk, xv, pp. 52 & 53. *C. plumialis*, on Khabarova; POPHAM, Ibis, 1898, p. 459.

Chætusia gregaria, in Italy. G. A. GRIFFOLI, Avicula, ii, pp. 34, 35.

Calidris arenaria, in Socotra; TRISTRAM, Ibis, 1898, pp. 148 & 149: on Khabarova; POPHAM, Ibis, 1898, p. 459.

Totanus stagnatilis, breeding in Hungary; GRUNACK, Ornith. Monber. vi, pp. 97-99. *T. glareola*, in Co. Mayo; SAUNDERS, Bull. B. O. C. viii, p. xvi. *T. solitarius*, notes on the breeding-habits; C. K. CLARKE, Auk, xv, pp. 328 & 329.

Actitis macularia, the method of removing its young; MERRILL, t. c. p. 52.

Numenius borealis, 1897 migration in Massachusetts; MACKAY, t. c. pp. 52 & 53.

Heteropygia maculata from Sussex; N. F. TICEHURST, Bull. B. O. C. viii, p. vi.

Tringa maculata, in Norfolk; NEWMAN, Zoologist, 1898, p. 25. *T. striata*, nesting in Franz Josef Land; W. E. CLARKE, Bull. B. O. C. vii, p. xxxvi; *id.* Ibis, 1898, p. 260. *T. fuscicollis*, in Franz Josef Land; *id.* t. c. p. 260. *T. temmincki*, on Waigats Island; PEARSON, t. c. pp. 201 & 202. *T. subarquata*, notes on nesting; POPHAM, t. c. pp. 515-517.

Phalaropus hyperboreus, on Khabarova; POPHAM, t. c. p. 459. *P. fulicarius*, in Lapland; R. COLLETT, Zoologist, 1898, p. 26.

Gallinago scolopacina, *G. gallinula*, geographical distribution in France; TURNER, Ornith. ix, pp. 33-84, maps 1 & 2. *G. stenura*, nesting on the Yenisei (lat. 65° 40' N.); POPHAM, Ibis, 1898, pp. 514 & 515. *G. australis*, discovery of the nest and eggs; CAMPBELL, Victorian Natural. xiv, pp. 170 & 171.

Scolopax rusticula orientalis, n. subsp., East Galicia; PRAZAK, J. Ornith. 1898, p. 333.

Sub-order OTIDES.

Otis tarda, notes on the gular pouch; PYCRAFT, Nat. Sci. xiii, pp. 313–323, figg. 1–5: exhibited; SOUTHWELL, Tr. Norfolk Soc. vi, pp. 385 & 386: skeleton figured; MEYER, Vogel-Skel. Lief. xxiv, Taf. ccxxxv. *O. tetrax*, in Norfolk; BUTLER, Zoologist, 1898, p. 125.

Sub-order PSOPHIÆ.

Psophia viridis and *P. obscura*, notes on; FINSCH, Notes Leyden Mus. xx, pp. 81–83. *P. obscura*, figured; SCLATER, Ibis, 1898, pl. xi.

Order ARDEIFORMES.

See FORBES (174).

Catalogue of the *Plataleæ* (Ibises and Spoonbills) in the collection of the British Museum. Vol. xxvi of the Catalogue of Birds by R. BOWDLER SHARPE, pp. 1–55.

Ibis (*Falcinellus*) *humeralis*, n. sp., Laloke River, S.E. New Guinea; DE VIS, Rep. Brit. New Guinea, 1898, p. 90.

Platalea leucorodia, new nesting-place in Holland; SCLATER, Bull. B. O. C. viii, pp. x & xi.

Catalogue of the *Herodiones* (Hérons and Storks) in the collection of the British Museum. Vol. xxvi of the Catalogue of Birds by R. BOWDLER SHARPE, pp. 56–286.

Phoxyx manillensis, figured; SHARPE, Cat. B. Brit. Mus. xxvi, pl. i.

Melanophoxyx vinaceigula, n. sp., Transvaal; SHARPE, *t. c.* pp. 105 & 106, pl. i A.

Notophoxyx, n. g., type *N. novæ-hollandiæ* (Lath.); SHARPE, *t. c.* p. 109.

N. aruensis, figured; SHARPE, *t. c.* pl. i B. *N. flavirostris*, nomen emend. pro *N. picata* (Gould) nec Raffles; SHARPE, *t. c.* p. 654.

Herodias eulophotes, figured; MEYER & WIGLESWORTH, B. Celebes, ii, pl. xlv.

Nyctanassa pauper, figured; SHARPE, Cat. B. Brit. Mus. xxvi, pl. i c.

Butorides spodiogaster, figured; SHARPE, *t. c.* pl. ii.

Tigrornis, n. g., type *T. leucolophus* (Jardine); SHARPE, *t. c.* p. 191.

Tigrisoma bahia, n. sp., Bahia; SHARPE, *t. c.* p. 196, pl. ii A.

Heterocnus, n. g., type *H. cabanisi* (Heine); SHARPE, *t. c.* p. 198.

Dupetor nesophilus, fig. 1, *D. melas*, fig. 2, figured; SHARPE, *t. c.* pl. iii.

Erythrophoxyx woodfordi, figured; SHARPE, *t. c.* pl. iv: *E. prætermisssa*, pl. v.

Ardetta podiceps and *A. payesi*, notes on; NEUMANN, J. Ornith. 1898, pp. 282–284. *A. eurythma*, figured; MEYER & WIGLESWORTH, B. Celebes, pl. xlv.

Botaurus exilis, in Nova Scotia; PIERS, Auk, xv, p. 195.

Dissura episcopus, breeding habits in Cachar; INGLIS, J. Bombay Soc. xii, pp. 217 & 218.

Order ANSERIFORMES.

Sub-order PHÆNICOPTERI.

Phænicopterus roseus, in Socotra; TRISTRAM, Ibis, 1898, pp. 148 & 149: notes on; CLARKE, pp. 479–481.

Phæniconias minor, near Bombay; MASON, J. Bombay Soc. xi, p. 552.

Sub-order ANSERES.

See CORDEAUX (119).

Notes on some specimens of *Anatidæ* in the late Count Ninni's collection; ARRIGONI DEGLI ODDI, Ibis, 1898, pp. 67-74.

Notes on thirty abnormal coloured *Anatidæ*; *id.* Orn. ix, pp. 109-126.

Indian Ducks and their allies; BAKER, J. Bombay Soc. xi, pp. 347-367, 555-584, xii, pp. 1-31.

Cygnus bewicki, on Khabarova; POPHAM, Ibis, 1898, p. 459.

Anser neglectus, in Italy; ARRIGONI DEGLI ODDI, *t. c.* pp. 173 & 174. *A. indicus*, figured; BAKER, J. Bombay Soc. xi, pl. iii.

Anseranus melanoleuca, its moult; BLAAUW, Ibis, 1898, pp. 310 & 311.

Bernicla brenta, in Warwickshire; COBURN, Zoologist, 1898, p. 24: note on the summer appearance in Lapland; COLLETT, *t. c.* pp. 25 & 26.

B. canadensis, near Dungeness; BRADSHAW, *t. c.* p. 216.

Casarca rutila, notes on; BAKER, J. Bombay Soc. xi, pp. 576-584.

Tadorna cornuta, notes on; *id. t. c.* xi, pp. 571-575.

Anas boscas, in Socotra; TRISTRAM, Ibis, 1898, pp. 148 & 149: notes on; BAKER, J. Bombay Soc. xii, pp. 1-11. *A. pæcilorhyncha*, notes on; *id. t. c.* pp. 11-18.

Chaulelasmus streperus, notes on; *id. t. c.* pp. 24-31: in Socotra; TRISTRAM, Ibis, 1898, pp. 148 & 149.

Dafila acuta, on Waigats Island; POPHAM, *t. c.* p. 549. *D. acuta* × *Querquedula crecca*; ARRIGONI DEGLI ODDI, Orn. ix, pp. 28-31.

Mareca penelope × *Dafila acuta*; *id.* Orn. ix, pp. 23-28.

Harelda glacialis, notes on the occurrences in Ireland; WARREN, Irish Natural. vii, pp. 121-124.

Eunetta falcata, notes on and figured; BAKER, J. Bombay Soc. xii, pp. 18-23, pl. v.

Somateria mollissima, in Styria and Vorarlberg; TSCHUSI ZU SCHMIDHOFFEN, Ornith. Jahrb. ix, p. 72.

Fuligula marila, on inland waters; MAXWELL, Ann. Scott. Nat. Hist. 1898, pp. 51 & 52. *F. nyroca*, in Ireland; COBURN, Zoologist, 1898, p. 25. *F. rufina*, in Westmorland; MACPHERSON, Ibis, 1898, pp. 176 & 177.

Dendrocygna fulva, notes on and figured; BAKER, J. Bombay Soc. xi, pp. 556-561, pl. iv: *D. javanica*, notes on; *id. t. c.* pp. 562-571.

Mergus merganser, on Waigats Island; PEARSON, Ibis, 1898, p. 198: skeleton figured; MEYER, Vogel-Skel. Lief. xxiv, Taf. ccxxxvii.

Order PELECANIFORMES.

See FORBES (174).

Catalogue of the *Steganopodes* in the collection of the British Museum; W. R. OGILVIE GRANT, Cat. B. Brit. Mus. xxvi, pp. 329-584.

Phaëton indicus, figured; GRANT, *t. c.* pl. vi. *P. rubricaudus*, near Guadalupe Is., Lower California; ANTHONY, Auk, xv, pp. 38 & 39.

P. flavirostris, skull figured; PYCRAFT, P. Zool. Soc. Lond. 1898, pl. vii, fig. 2, pl. viii, figg. 1, 1a & 5: Sternum, p. 87, fig. 1: Pelvis, p. 89, fig. 4: Humerus, p. 90, fig. 5.

Sula websteri, n. sp., Clarion Island, Galapagos; ROTHSCHILD, Bull. B. O. C. vii, p. lii. *S. leucogastra*, skull figured; PYCRAFT, P. Zool. Soc. Lond. 1898, pl. viii, fig. 2.

- Phalacrocorax stewarti*, n. sp., Stewart Island, New Zealand; GRANT, Cat. B. Brit. Mus. xxvi, pp. 385 & 386, pl. v A. *P. harrisi*, n. sp., Narborough Island, Galapagos; ROTHCHILD, Bull. B. O. C. vii, p. lii. *P. traversi*, n. sp., Macquarie Is.; *id. op. cit.* viii, p. xxi. *P. carbo*, skull figured; PYCRAFT, P. Zool. Soc. Lond. 1898, pl. vii, fig. 3, pl. viii, fig. 3: Sternum, p. 88, fig. 2: Pelvis, fig. 3: Humerus, p. 90, fig. 7.
- Micruria*, n. g., type *M. hypoleuca* (Xantus); GRANT, Cat. B. Brit. Mus. xxvi, p. 594.
- Pelecanus thagus*, figured; GRANT, *t. c.* pl. v B. *P. rufescens*, skull figured; PYCRAFT, P. Zool. Soc. Lond. 1898, pl. viii, fig. 6: Humerus, p. 90, fig. 6. *P. onocrotalus* in Bohemia; V. TSCHUSI ZU SCHMIDHOFFEN, Ornith. Jahrb. ix, p. 72: in Hesse; C. POGGE, *t. c.* p. 120.
- †*P. crispus*, [fossil] from the Lake-dwellings, Glastonbury, Somersetshire; ANDREWS, P. Zool. Soc. Lond. 1898, p. 852: note on some bones from the Cambridgeshire Fens; HARMER, Tr. Norfolk Soc. vi, pp. 363 & 364.
- Fregata ariel*, skull figured; PYCRAFT, P. Zool. Soc. Lond. 1898, pl. vii, fig. 1, pl. viii, fig. 4.

Order ACCIPITRIFORMES.

- Catalogue of the *Accipitres* in the Australian Museum, Sydney. See RAMSAY, E. P. (402A.)
- Die Raubvögel des Fürstentums Lübeck und nächsten Umgebung; BIEDERMAN, Orn. Monber. vi, pp. 73–81, 121–130, 159–169.
- Vultur monachus* in Livonia and Salzburg; V. TSCHUSI ZU SCHMIDHOFFEN, Ornith. Jahrb. ix, pp. 118 & 119: notes on; BAKER, J. Bombay Soc. xi, pp. 391 & 392.
- Catharista atrata*, near Quebec, Canada; DIONNE, Auk, xv, p. 53: in Nova Scotia; PIERS, *t. c.* p. 196.
- Circus pallidus* in Bavaria; FR. VON BESSERER, Ornith. Jahrb. ix, p. 156. *C. cineraceus* and *C. cyaneus*, remarks on; LETACQ, Bull. Soc. Rouen, xxiii, pp. 12–16.
- Polyborus cheriway pallidus*, subsp. n., Tres Marias Is.; NELSON, P. Soc. Washington, xii, p. 8. *P. tharus*, notes on the colour of the face; BIEDERMANN, Ornith. Monber. vi, pp. 166 & 167.
- Melierax mechowii* in Mashonaland; SHARPE, Bull. B. O. C. vii, p. xxxvi.
- Astur butleri*, n. sp., Car Nicobar; GURNEY, Bull. B. O. C. vii, p. xxvii: *id.* Ibis, 1898, p. 313.
- A. torquatus* and its allies, notes on; HARTERT, Nov. Zool. v, pp. 121 & 122.
- Accipiter minullus tropicalis*, n. subsp., East Africa; REICHENOW, J. Ornith. 1898, p. 139. *A. nisus*, food; TILSCH, Aquila, v, pp. 297 & 298. *A. nisus punicus*, figured; VON ERLANGER, J. Ornith. 1898, pp. 429–432, Taf. viii, fig. 1. *A. nisus nisus*, figured, *id. t. c.* fig. 2 (head).
- Buteo borealis fumosus*, subsp. n., Tres Marias Is.; NELSON, P. Soc. Washington, xii, p. 7. *B. ferox* in Austria; V. TSCHUSI ZU SCHMIDHOFFEN, Ornith. Jahrb. ix, p. 234. *B. zimmermannæ*, and *B. menetriesi*, remarks on; EHMCKE, J. Ornith. 1898, pp. 141–146: REICHENOW, *t. c.* pp. 146 & 147. *B. cirtensis* from N.E. Africa, distinct; *id. t. c.* p. 147.
- Archibuteo lagopus*, on Waigats Island; PEARSON, Ibis, 1898, pp. 194 & 195.
- Butaster indicus*, skeleton figured; MEYER, Vogel-Skel. Lief. xxii, Taf. cxi.
- Gypaetus barbatus atlantis*, n. sp., Tunis; VON ERLANGER, J. Ornith. 1898, pp. 395–400, Tafeln iv & v.
- Aquila rapax albicans*, Rüpp., notes on and figured; VON ERLANGER, J. Ornith. 1898, pp. 418–424, Taf. vii.

- Limnaetus limnaetus floris*, n. subsp., Flores; HARTERT, Nov. Zool. v, p. 46.
- Spizaetus lanceolatus*, figured; MARTORELLI, Mem. Mus. Milano, vi: ad. (pl. ii, fig. 1), juv. (pl. iii, fig. 1), figured; MEYER & WIGLESWORTH, B. Celebes.
- Spilospizias trinotatus*, imm. figured; *id.* t. c. pl. i.
- Circaetus gallicus hypoleucus* is the Eastern race of *C. gallicus*; HARTERT, Nov. Zool. v, p. 46.
- Spilornis cheela*, notes on; BAKER, J. Bombay Soc. xi, pp. 394–396.
- Haliaetus leucocephalus washingtoni* (Aud.), subsp. rest., E. North America; BANGS, Auk, xv, pp. 174–176.
- Milvus korschun reichenowi*, n. subsp., Tunis; VON ERLANGER, J. Ornith. 1898, pp. 404–408, Taf. vi, figg. 1–3. *M. korschun korschun*, figured (head); *id.* t. c. Taf. vi, figg. 4 & 5. *M. migrans*, breeding near Verona, notes on synonymy; ARRIGONI DEGLI ODDI, J. Ornith. 1898, pp. 524–537: in Heligoland; HARTLAUB, Ornith. Monber. vi, p. 100.
- Pernis celebensis*, ad. (pl. ii, fig. 2), juv. (pl. iii, fig. 2), figured; MEYER & WIGLESWORTH, B. Celebes: figured; MARTORELLI, Mem. Mus. Milano, vi.
- Microhierax fringillarius*, in the Chutla Bheel, Cachar; INGLIS, J. Bombay Soc. xii, p. 217. *M. melanoleucus*, exhibition and remarks upon; SCLATER, P. Zool. Soc. London, p. 138, cum figg. *M. erythrogeus*, in Negros, Philippines; CLARKE, Ibis, 1898, p. 122.
- Hierofalco sacer* and allies, notes on; PRAZAK, J. Ornith. 1898, pp. 224 & 225.
- Falco naumanni*, Fleischer., original description of; REICHENOW, Ornith. Monber. vi, p. 143. *F. subbuteo*, nesting in Hants.; HORSBRUGH, Zoologist, 1898, p. 24; ARMISTEAD, t. c. p. 83; CORBIN, t. c. p. 125. *F. severus indicus*, n. subsp. India; MEYER & WIGLESWORTH, B. Celebes, i, p. 84. *F. feldeggii*, Schl., figured (head); VON ERLANGER, J. Ornith. 1898, Taf. ix, pp. 455–461. *F. subbuteo gracilis* (C. L. Brehm), figured; *id.* t. c. Taf. x & xi, pp. 461–466. *F. peregrinus*, on Khabarova; POPHAM, Ibis, 1898, p. 459. *F. cenchris* in Bavaria; PARROT, Ornith. Jahrb. ix, p. 120. *F. sparverius*, alternation of sex in the young; SHUFELDT, American Naturalist, xxxii, pp. 567–570.
- Cerchneis cenchris*, in Aberdeenshire; SIM, Ann. Scott. Nat. Hist. 1898, p. 51. *C. fieldi*, nesting near Machakos, British East Africa; HINDE, Ibis, 1898, p. 583.
- Tinnunculus moluccensis orientalis*, n. subsp., Eastern Moluccas; MEYER & WIGLESWORTH, B. Celebes, i, p. 79.
- Polioaetus humilis major*, n. subsp. (nom. emend. pro *P. plumbeus*, Hodgs.) (nom. nudum), Himalayas; MEYER & WIGLESWORTH, B. Celebes, i, p. 44.

Order STRIGIFORMES.

- Catalogue of the *Striges* in the Australian Museum, Sydney. See RAMSAY, E. P. (402A.)
- A contribution towards our knowledge of the morphology of the Owls; PYCRAFT, Tr. Linn. Soc. (2) Zool. vii, pp. 223–275, pls. 24–29.
- Bubo maculosa*, pterylosis figured; *id.* t. c. pl. 26, fig. 5. *B. nycterus* [lege *nycteus*], pterylosis described and figured; t. c. pp. 241 & 242, pl. 26, fig. 4. *B. abyssinicus*, in Somaliland; SHARPE, Bull. B. O. C. vii, p. xxvi. *B. ascalaphus barbarus*, notes on; VON ERLANGER, J. Ornith. 1898, pp. 492–495. *B. ascalaphus desertorum*; *id.* t. c. pp. 495–497.
- Scops leucotis*, pterylosis figured; PYCRAFT, Tr. Linn. Soc. (2) Zool. vii, pls. 26, fig. 3, 28, fig. 3. *S. magicus* and allies, notes on; FINSCH, Notes Leyden Mus. xx, pp. 163–184, pls. 9 & 10.

- Pisorhina ugandæ*, n. sp., N. Uganda; NEUMANN, J. Ornith. 1898, p. 500.
P. sulaensis, n. sp., Sula Is.; HARTERT, Nov. Zool. v, p. 126.
P. sylvicola, Wall. (fig. 1), and *P. alfredi*, Hartert (fig. 2), figured; *id. t. c.* pl. i. *P. scops*, in Upper Austria; V. TSCHUSI ZU SCHMIDHOFFEN, Ornith. Jahrb. ix, pp. 117 & 118: in Lower Austria; KOLLER, *t. c.* p. 199.
Cephaloptynx punctulata, skeleton figured; MEYER, Vogel-Skel. Lief. xxii, Taf. ccxii.
Megascops aspersus, in Arizona; BREWSTER, Auk, xv, p. 186.
Ninox ochracea, ad. et juv. figured; MEYER & WIGLESWORTH, B. Celebes, pl. iv.
Nyctala tengmalmi, pterylosis figured; PYCRAFT, Tr. Linn. Soc. (2) Zool. vii, pl. 26, fig. 4, pl. 27, figg. 5-7.
Speotyto cunicularia, pterylosis figured; *id. t. c.* pl. 26, fig. 2, pl. 28, fig. 5. *S. cunicularia obscura*, Stephens, note on; MCGREGOR, Auk, xv, p. 187.
Otus vulgaris, in the Outer Hebrides; IRBY, Ann. Scott. Nat. Hist. 1898, p. 50.
Asio accipitrinus, its pterylography described and figured; PYCRAFT, Tr. Linn. Soc. (2) Zool. vii, pp. 228-234, pls. 24 & 25: on Muskeget Island; MILLER, Auk, p. 75: MACKAY, *t. c.* p. 210: BREWSTER, *t. c.* p. 211.
Syrnium occidentale caurinum, n. subsp., Washington Territory; MERRIAM, *t. c.* pp. 40 & 41. *S. aluco*, pterylosis described and figured; PYCRAFT, Tr. Linn. Soc. (2) Zool. vii, pp. 245-247, pl. 26, fig. 6, pl. 28, figg. 1 & 2.
Strix flammea, pterylosis described and figured; *id. t. c.* pp. 251-255: its food; CORDEAUX, Zoologist, 1898, p. 215. *S. flammea contempta*, n. subsp., N.W. Ecuador; HARTERT, Nov. Zool. v, p. 500.

Order CORACIIFORMES.

Sub-order PODARGI.

- Podargus meeki*, n. sp., Sudest Is., Louisiade Archipelago; HARTERT, Bull. B. O. C. viii, p. viii.

Sub-order CORACIÆ.

- Coracias temmincki*, skeleton figured; MEYER, Vogel-Skel. Lief. xxii, Taf. ccxiii.

Sub-order MEROPES.

- Merops ornatus* (figg. 1, 3, 4), *M. philippinus* (fig. 2), tails figured; MEYER & WIGLESWORTH, B. Celebes, pl. viii.

Sub-order HALCYONES.

- Pelargopsis melanorhyncha eutreptorhyncha*, n. subsp., Sula Is.; HARTERT, Nov. Zool. v, p. 128. *P. dicrorhyncha*, figured; MEYER & WIGLESWORTH, B. Celebes, pl. ix, fig. 1. *P. melanorhyncha*, skeleton figured; MEYER, Vogel-Skel. Lief. xxii, Taf. ccxv.
Ceycopsis sanghirensis, n. sp., Sangi Islands; MEYER & WIGLESWORTH, B. Celebes, i, p. 278, pl. x, figg. 2 & 3. *C. fallax*, figured; *id. t. c.* pl. x, fig. 1.
Ceyx innominata and *C. euerythra*, notes on; HARTERT, Nov. Zool. v, p. 471.

- Halcyon cinnamomina*, notes on; *id. t. c.* p. 52. *H. mediocris* = *H. reichenbachii* ♂ ad.; *id. t. c.* p. 53. *H. anachoreta* and *H. pachyrhynchus*, n. spp., Bismarck Archipelago; REICHENOW, Ornith. Monber. vi, pp. 47 & 48. *H. pileata*, in the Chutla Bheel, Cachar; INGLIS, J. Bombay Soc. xii, p. 217. *H. coromanda*, *H. chloris*, skeletons figured; MEYER, Vogel-Skel. Lief. xxii, Taf. ccxvi.
- Monachalcyon capucinus*, figured; MEYER & WIGLESWORTH, B. Celebes, pl. ix, fig. 2.
- Tanysiptera sylvia*, eggs described; LE SOUËF, Ibis, 1898, p. 55.

Sub-order BUCEROTES.

- Rhabdotorrhinus*, n. gen., type *R. exaratus* (T.); MEYER & WIGLESWORTH, B. Celebes, i, p. 235.
- Hydrocorax hydrocorax*, skeleton figured; MEYER, Vogel-Skel. Lief. xxiii, Taf. ccxxi–ccxxii.
- Rhytidoceros narcondami*, notes on; ST JOHN, J. Bombay Soc. xii, pp. 212–214.
- Dichoceros bicornis*, skeleton figured; MEYER, Vogel-Skel. Lief. xxii, Taf. ccxix & ccxx.
- Rhinoplax vigil*, skeleton figured; *id. t. c.* Lief. xxiii, Taf. ccxxiii & ccxxiv.
- Ceratogymna atrata*, skeleton figured; *id. t. c.* Lief. xxiii, Taf. ccxxv.

Sub-order UPUPÆ.

- Upupa epops*, in High Tibet; SCLATER, Bull. B. O. C. vii, p. lvii.

Sub-order MOMOTI.

- Prionorhynchus platyrhynchus minor*, n. subsp., Panama; HARTERT, Nov. Zool. v, p. 498.

Sub-order CAPRIMULGI.

- Caprimulgus ruficollis*, in Sicily; T. DE STEFANI, Avicula, ii, p. 102.
- Caprimulgus torridus*, n. sp., the Haud, Somali Land; LORT PHILLIPS, Bull. B. O. C. viii, p. xxiii. *C. celebensis*, figured; MEYER & WIGLESWORTH, B. Celebes, pl. xi, fig. 1. *C. manilensis*, in Negros, Philippines; CLARKE, Ibis, 1898, p. 121. *C. griseatus*, egg figured; GRANT & WHITEHEAD, *t. c.* pl. vi, fig. 7.
- Nyctidromus albicollis insularis*, n. subsp., Tres Marias Is.; NELSON, P. Soc. Washington, xii, p. 9.
- Lyncornis macropterus*, figured; MEYER & WIGLESWORTH, B. Celebes, pl. xi, fig. 2; skeleton figured; MEYER, Vogel-Skel. Lief. xxii, Taf. ccxiii.
- Chordeiles virginianus sennetti*, at Madison, Minn.; LANG, Auk, xv, pp. 54 & 55.
- Antrostomus carolinensis*, devouring other birds; STONE, *t. c.* p. 330.
- Egotheles pulcher*, n. sp., Mts. of British New Guinea; HARTERT, Bull. B. O. C. viii, p. viii.

Sub-order CYPSELI.

- Chætura celebensis*, figured; MEYER & WIGLESWORTH, B. Celebes, pl. xii.
- Panyptila cayennensis*, figured; notes on the species; RICHMOND, Auk, xv, pp. 7–10, pl. i.

Sub-order TROCHILI.

- Amazilia cinnamomea saturata*, n. subsp., Chiapas, Mexico; NELSON, P. Soc. Washington, xii, p. 63. *A. cerviniventris chalconota*, n. subsp., Texas; OBERHOLSER, Auk, xv, pp. 32-36, 188.
- Chalcostigma purpureicauda*, n. sp., Colombia; HARTERT, Bull. B. O. C. vii, p. xxviii.
- Eulampis*, notes on the genus; HARTERT, Nov. Zool. v, p. 520.
- Cyanolesbia*, notes on the genus; *id. t. c.* pp. 514-516.
- Florisuga*, notes on the genus; *id. t. c.* pp. 516 & 517.
- Chrysuronia* = *Hylocharis*; HARTERT, Nov. Zool. v, pp. 519 & 520.
- Hylocharis ruficollis maxwelli*, n. subsp., E. Bolivia; HARTERT, Nov. Zool. v, p. 519.
- Polyerata*, notes on the genus; HARTERT, Nov. Zool. v, pp. 517 & 518.
- Chrysuronia*, notes on the genus; HARTERT, Nov. Zool. v, pp. 518 & 519.
- C. ænone intermedia*, n. subsp., Upper Amazonia; *id. t. c.* p. 519.
- Leucuria*, n. g., type *L. phalerata*, n. sp., Santa Marta, Colombia; BANGS, P. Soc. Washington, xii, p. 174.
- Cyanolesbia berlepschi*, n. sp., Venezuela; HARTERT, Bull. B. O. C. viii, p. xvi.
- Chrysolampis chlorolæmus*, notes on; BERLEPSCH, Ibis, 1898, pp. 65-67.
- Atthis morcomi*, n. sp., Arizona; RIDGWAY, Auk, xv, pp. 325 & 326.

Sub-order TROGONES.

- Trogon ambiguus goldmanni*, n. subsp., Tres Marias Is.; NELSON, P. Soc. Washington, xii, p. 8.

Order COCCYGES.

Sub-order MUSOPHAGI.

- Catalogue of the Cuckoos and Plantain-eaters in the Derby Museum; FORBES & ROBINSON, Bull. Liverp. Mus. i, pp. 46-48.
- Turacus hybridus*, n. sp., Ukiami Mts., German East Africa; REICHENOW, J. Ornith. 1898, p. 314.
- T. sharpei*, n. sp., Niam-Niam; REICHENOW, Ornith. Monber. vi, p. 182.
- T. zenkeri*, eggs described; *id. t. c.* p. 65.

Sub-order CUCULI.

- Catalogue of the Cuckoos and Plantain-eaters in the Derby Museum; FORBES & ROBINSON, Bull. Liverp. Mus. i, pp. 37-46.
- Food of Cuckoos: BEAL, U. S. Agric. Bull., No 9, pp. 7-14.
- Cuculi*, notes on the bird fauna of the Box Hill district; HALL, Victorian Naturalist, xv, pp. 70-72, 75-80: notes on; CAMPBELL, *t. c.* pp. 80-87.
- Surniculus musschenbroeki*, note on; HARTERT, Nov. Zool. v, p. 119, note.
- Cuculus canorus*, notes on; WILSON, Zoologist, 1898, pp. 270 & 271, 359-361, 431-433; DAVENPORT, *t. c.* pp. 430 & 431; TUCK, *t. c.* pp. 477 & 478; GURNEY, Tr. Norfolk Soc. vi, pp. 365-384, cum tab.: in captivity; CAMPBELL, Ann. Scott. Nat. Hist. 1898, p. 116.
- Cacomantis variolosus*, notes on; CAMPBELL, Victorian Natural. xv, pp. 18-20.
- Chalcococcyx newwenhuysi*, n. sp., Halmahera, Moluccas; VORDERMAN, Nat. Tijds. Nederl. Indië, lviii, Afl. 2.

- Chalcites minutillus* parasitic on *Gerygone personata* and *G. magnirostris*; LE SOUËF, Ibis, 1898, p. 59. *C. plagosus*, notes on; CAMPBELL, Victorian Natural. xiv, pp. 143-146. *C. basalis*, notes on; *id. t. c.* pp. 151-153; GOUDIE, *t. c.* p. 172.
- Eudynamis*, skull figured; BEDDARD, P. Zool. Soc. Lond., 1898, pp. 48 & 49, figg. 2, 4. *E. melanorhyncha*, skeleton figured; MEYER, Vogel-Skel. Lief. xxiii, Taf. ccxxviii.
- Centropus fasciopygialis*, n. sp., E. and S.E. Africa; REICHENOW, Ornith. Monber. vi, p. 23.
- Carpococcyx radiatus* and *C. viridis*, notes on; FINSCH, Notes Leyden Mus. xx, pp. 97-100.
- Phœnicophaes calorhynchus*, skeleton figured; MEYER, Vogel-Skel. Lief. xxiii, Taf. ccxxix.
- Scythrops novæ-hollandiæ*, anatomy of; BEDDARD, P. Zool. Soc. Lond., 1898, pp. 44-49, figg. 1, 3 (skull).
- Piaya*, remarks on the species; HARTERT, Nov. Zool. v, pp. 499 & 500.

Order PSITTACIFORMES.

- Notes on the bird fauna of the Box Hill district; HALL, Victorian Naturalist, xv, pp. 70-72, 75-80.
- On the position of the feet in flight among "Picarian" birds and Parrots; FINN, P. Asiat. Soc. Bengal, 1898, pp. 1-3.
- Microglossus aterrimus*, notes on the nesting-habits; LE SOUËF, Ibis, 1898, p. 56.
- Calyptorhynchus stellatus*, notes on; COLLETT, P. Zool. Soc. Lond. 1898, pp. 355 & 356.
- Cacatua parvula occidentalis*, n. subsp., Lombok and Flores; HARTERT, Nov. Zool. v, p. 120.
- Nestor notabilis*, notes on; GODFREY, Zoologist, 1898, pp. 216 & 217.
- Eos kuehni*, n. sp., Little Kei Is., Moluccas; HARTERT, Nov. Zool. v, p. 110.
- Eos rubra*, auct. should stand as *E. bornea* (Linn.); ROTHSCILD, *t. c.* pp. 509 & 510, pl. xviii, fig. 1.
- Lorius hypenochrous devittatus*, n. subsp., Fergusson Is., Dentrecasteaux group; HARTERT, *t. c.* p. 530.
- Trichoglossus hæmatodus fortis*, n. subsp., Sumba Is.; *id. t. c.* p. 120.
- Charmosyna atrata*, n. sp., S.E. New Guinea; ROTHSCILD, Bull. B. O. C. vii, p. liv.
- Psitteuteles neglectus*, n. sp., N. Queensland; REICHENOW, Ornith. Monber. vi, pp. 4 & 5.
- Psitteuteles weberi*, from S. Flores, notes on; HARTERT, Nov. Zool. v, pp. 43 & 44.
- Cyclopsittacus inseparabilis*, n. sp., Sudest Is., Louisiade Archipelago; HARTERT, Bull. B. O. C. viii, p. ix.
- C. nanus*, n. sp., Wharton Range, S.E. New Guinea; DE VIS, Rep. Brit. New Guinea, 1898, App. p. 81 [= *C. suavissimus*, ROTHSCILD, Nov. Zool. v, p. 511].
- C. macilwraithi*, figured; ROTHSCILD, Nov. Zool. v, p. 510.
- Neopsittacus viridiceps*, De Vis = *N. pullicauda*, Hartert; ROTHSCILD, Nov. Zool. v, p. 510.
- Oreopsittacus viridigaster* [lege *chlorogaster*], n. sp., Wharton Range, S.E. New Guinea; DE VIS, Rep. Brit. New Guinea, 1898, App. p. 81. *O. viridigaster*, De Vis = *O. grandis*, Grant; ROTHSCILD, Nov. Zool. v, p. 510.
- Poicephalus matschiei*, n. sp., East Africa; NEUMANN, J. Ornith. 1898, p. 501. *P. damarensis*, n. sp., S.W. Africa; *id. t. c.* p. 501. *P. reichenowi*, n. sp., North Angola; *id. t. c.* p. 501.

- Poicephalus suahelicus*, East Africa, *P. angolensis*, Angola and Damara-land, nn. subsp.; REICHENOW, J. Ornith. 1898, pp. 313 & 314.
- Geoffroyius tjindanæ* and allies, notes on; HARTERT, Nov. Zool. v, pp. 472 & 473.
- Prioniturus platurus talautensis*, n. subsp., Talaut Is.; HARTERT, Nov. Zool. v, p. 89. *P. platurus* (pls. v & vi, fig. 4), *P. flavicans* (pl. vi, figg. 1-3), growth of racket in tail figured; MEYER & WIGLESWORTH, B. Celebes.
- Conurus carolinensis*, breeding in captivity; NOWOTNY, Auk, xv, pp. 28-32.
- Conuropsis carolinensis*, skeleton figured; MEYER, Vogel-Skel. Lief. xxiii, Taf. ccxxvi.
- Aprosmictus sulaensis*, figured; MEYER & WIGLESWORTH, B. Celebes, pl. vii.
- Platycercus ignitus*, in Victoria; CAMPBELL, Victorian Natural. xv, p. 96.
- Spathopterus alexandræ*, in West Australia; NORTH, Tr. R. Soc. S. Australia, xxii, p. 130.
- Psephotus chrysapterygus*, figured; PHILLIPS, Avicult. Mag. iv, pl. to p. 153.
- P. dissimilis*, n. sp., North Australia; COLLETT, P. Zool. Soc. Lond. 1898, pp. 356 & 357.
- Loriculus vernalis* & *L. indicus*, nesting-habits; BUTLER, J. Bombay Soc. xi, p. 736.
- Nasiterna orientalis*, n. sp., Wharton Range, S.E. New Guinea; DE VIS, Rep. Brit. New Guinea, 1898, App. p. 81.
- Neophema venusta*, notes on the life-history; HALL, Victorian Natural. xv, pp. 64-66.

Order SCANSORES.

- Rhamphastides*. See FORBES & ROBINSON (177).
- Aulacorhamphus lautus*, n. sp., Santa Marta, Colombia; BANGS, P. Soc. Washington, xii, p. 173.

Sub-order CAPITONES.

- See FORBES & ROBINSON (177).
- Stactolæma sowerbyi*, n. sp., Mashona Land; SHARPE, Bull. B. O. C. vii, p. xxxvi., figured; SOWERBY, Ibis, 1898, pl. xii, fig. 1.
- Smilorhis*=*Stactolæma*; SHARPE, Ibis, 1898, p. 573.
- Tricholæma blandi*, figured; LORT PHILLIPS, Ibis, 1898, pl. ix, fig. 1.

Sub-order INDICATOIRES.

- See FORBES & ROBINSON (177).
- Melignomon*, n. gen., type *M. zenkeri*, n. sp., Cameroons; REICHENOW, Ornith. Monber. vi, pp. 22 & 23.

Sub-order PICI.

- See FORBES & ROBINSON (177).
- Colaptes auratus luteus*, n. subsp., Eastern North America; BANGS, Auk, xv, pp. 177 & 178.
- Gecinus rabieri*, n. sp., Tonkin; OUSTALET, Bull. Mus. Paris, 1898, p. 12.
- G. rodgeri*, n. sp., Perak, Malay Peninsula; HARTERT & BUTLER, Nov. Zool. v, p. 508.
- Melanerpes wagleri sanctæ-martæ*, n. subsp., Santa Marta, Colombia; BANGS, P. Soc. Washington, xii, p. 134. *M. torquatus*, storing acorns; BREWSTER, Auk, xv, p. 188.

- Dendrocopus major*, skeleton figured; MEYER, Vogel-Skel. Lief. xxiii, Taf. ccxxvi.
- Chrysophlegma ricketti*, n. sp., Fohkien; STYAN, Bull. B. O. C. vii, p. xl.
- Dryobates villosus monticola*, nomen emend. pro *Dryobates v. montanus*; ANTHONY, Auk, xv, p. 54.
- Lepocestes sinensis*, young female described; RICKETT & LA TOUCHE, Ibis, 1898, p. 333.
- Micropternus gularis*, note on the nesting; WILSON, J. Bombay Soc. xi, pp. 744 & 745.
- Ceophlæus pileatus abieticola*, n. subsp., Eastern United States; BANGS, Auk, xv, pp. 176 & 177.
- Microstictus fulvus*, skeleton figured; MEYER, Vogel-Skel. Lief. xxiii, Taf. ccxxvii.
- Campephilus imperialis*, notes on and figured; NELSON, Auk, xv, pp. 217-223, pl. iii.
- Iyngipicus grandis excelsior*, n. subsp., Alor Isl.; HARTERT, Nov. Zool. v, p. 461.

Sub-order BUCCONES.

Bucconidæ. See FORBES & ROBINSON (177).

Sub-order GALBULÆ.

Galbulidæ. See FORBES & ROBINSON (177).

Galbula ruficauda pallens, n. subsp., Santa Marta, Colombia; BANGS, P. Soc. Washington, xii, p. 133.

Order PASSERIFORMES.

Family CORVIDÆ.

- Corvus corone*, in Hungary; CHERNEL, Aquila, v, pp. 289-292. *C. splendens*, note on; FINN, Ibis, 1898, p. 458. *C. corax principalis*, breeding in New England; JOB, Auk, xv, p. 55. *C. kubaryi*, Reichen. is from the Marianne Is. and probably not from Pelew Is.; HARTERT, Nov. Zool. v, p. 59. *C. pusillus*, egg figured; GRANT & WHITEHEAD, Ibis, 1898, pl. vi, fig. 5.
- Nucifraga kamtschatkensis*, n. sp., Kamtschatka; BARRETT-HAMILTON, Bull. B. O. C. vii, p. xlvi.
- Garrulus glandarius*, in Berwickshire; STUART, Ann. Scott. Nat. Hist. 1898, pp. 48 & 49; MAXWELL, t. c. p. 114. *G. anops*, described; WHITAKER, Ibis, 1898, p. 606.
- Perisoreus sibiricus*, Tacz., notes on; JOHANSEN, Ornith. Jahrb. ix, pp. 179 & 180.
- Cyanocorax heilprini*, Gentry, figured; FORBES, Bull. Liverp. Mus. i, p. 85, pl. iii.

Family PARADISEIDÆ.

Monograph of the *Paradiseidæ*, or Birds of Paradise, and *Ptilonorhynchidæ* [q. v.], or Bower-birds. Pt. viii: by R. B. SHARPE, London, 1898, folio. Completed with Introduction and Appendix, pp. i-xl. The following species are figured:—*Paryphephorus duivenbodii*, *Astrapia splendidissima*, *Paradisea intermedia*, *P. decora*, *Phonygama hunsteini*, *Manucodiu atra*.

- Heteroptilorhis*, n. g., type *H. mantoui* (Sharpe); SHARPE, Monogr. Parad. Introd. p. x.
- Calastrapia*, n. g., type *C. splendidissima* (Rothsch.); SHARPE, *t. c.* p. xiii : note on; ROTHSCHILD, Nov. Zool. v, p. 85.
- Manuccdia*, notes on the genus; ROTHSCHILD, Nov. Zool. v, pp. 84 & 85.
- M. orientalis*=*M. chalybata*. *M. jobiensis* and *M. rubiensis*, distinct from *M. chalybata*; *id. t. c.* p. 84. *M. gouldi*, nest and eggs described and figured (Photograph); LE SOUËF, Ibis, 1898, pp. 54 & 55.
- Falcinellus striatus* is the correct name for *Epimachus speciosus*, Auct.; ROTHSCHILD, Nov. Zool. v, p. 85.
- Seleucides ignota* (Foster), and *S. melanoleuca* (Daud.), notes on; *id. t. c.* pp. 86 & 87. *S. ignota*, its egg; ROTHSCHILD, Bull. B. O. C. viii, p. xiv.
- Diphyllodes*, the species usually recognised cannot be separated specifically; ROTHSCHILD, Nov. Zool. v, p. 89.

Family PTILONORHYNCHIDÆ.

- Monograph of the *Paradiseidæ* [q. v.], or Birds of Paradise, and *Ptilonorhynchidæ*, or Bower-birds. Pt. viii: by R. B. SHARPE, London, 1898, folio. Completed with Introduction and Appendix, pp. i-xl. The following species are figured:—*Amblyornis flavifrons*, *A. inornata*, ♂, *Chlamydodera cerviniventris*, *C. maculata*, *C. nuchalis*.
- Chlamydera occipitalis*, not distinct from *C. maculata*. *C. orientalis*=*C. nuchalis*; ROTHSCHILD, Nov. Zool. v, p. 86.

Family STURNIDÆ.

- Artamus leucogaster*, skeleton figured; MEYER, Vogel-Skel. Lief. xxii, Taf. ccxviii.
- Sturnus unicolor*, notes on; WHITAKER, Ibis, 1898, pp. 605 & 606.
- Pastor roseus*, in West Ross-shire; FOWLER, Ann. Scott. Nat. Hist. 1898, p. 49.
- Enodes erythrophrys*, skeleton figured; MEYER, Vogel-Skel. Lief. xxii, Taf. ccxvii.
- Pholidauges sharpii*, n. sp., Nandi, Equatorial Africa; JACKSON, Bull. B. O. C. viii, p. xxii.
- Calornis metallica*, nest and eggs described; LE SOUËF, Ibis, 1898, pp. 52 & 53. *C. panayensis*, egg figured; GRANT & WHITEHEAD, *t. c.* pl. vi, fig. 1. *C. sulaensis*, ad. et juv. figured; MEYER & WIGLESWORTH, B. Celebes, ii, pl. xxxvi, figg. 2 & 3.
- Basileornis galeatus*, figured; *id. t. c.* pl. xxxvi, fig. 1: from the Sula Is.; HARTERT, Nov. Zool. v, p. 134.
- Amydrus nyasæ*, n. sp., Nyasaland; SHELLEY, Ibis, 1898, p. 557.

Family EULABETIDÆ.

- Necropsar leguati*, n. sp., Ile au Mât, S. of Rodriguez; FORBES, Bull. Liverp. Mus. i, pp. 29-35, pl. i.

Family DICRURIDÆ.

- Dicrurus leucops* (pl. xxiv, figg. 1 & 2), *D. leucops axillaris* (pl. xxiv, fig. 3), figured; MEYER & WIGLESWORTH, B. Celebes, vol. ii, pl. xxiv.
- Chibia carbonaria dejecta*, n. subsp., Sudest Is., Louisiades; HARTERT, Nov. Zool. v, p. 522.

Family ORIOLIDÆ.

- Oriolus formosus sanghirensis*, n. subsp., Great Sangi Is.; MEYER & WIGLESWORTH, B. Celebes, p. 591. *O. galbula*, in Forfarshire; DEWAR, Ann. Scott. Nat. Hist. 1898, pp. 179 & 180. *O. melanisticus*, figured; MEYER & WIGLESWORTH, B. Celebes, ii, pl. xxxvii.
- Sphecotheres hypoleucus*, n. sp., Island of Wetter; FINSCH, Notes Leyden Mus. xx, pp. 129 & 130.

Family ICTERIDÆ.

- Gymnostinops cassini*, n. sp., Colombia; RICHMOND, Auk, xv, pp. 326 & 327.
- Sturnella magna neglecta*, its song; BELDING, Auk, xv, pp. 56 & 57.
- Icterus gualanensis*, n. sp., Guatemala; UNDERWOOD, Bull. B. O. C. vii, p. lix.
- Quiscalus macrourus*, probably polygamous; CHAPMAN, Auk, xv, p. 269.

Family PLOCEIDÆ.

- Oreostruthus*, nomen emend. pro *Oreospiza*; DE VIS, Ibis, 1898, pp. 174 & 175.
- Lagonosticta senegala rendallii*, n. subsp., Upper Shirè River, Nyasaland; HARTERT, Nov. Zool. v, p. 72.
- Poephila mirabilis*, note on the ornamentation of the mouth in the young; BUTLER, Avicult. Mag. v, pp. 25-27 cum tab. figg. 1-4. *P. leucotis*, figured; PHILLIPS, Avicult. Mag. iv, pl. to p. 169.
- Munia rubronigra* acclimatised in Italy; R. GRAGNIANI, Avicula, ii, p. 6.
- Munia scratchleyana* & *M. nigritorquis*, n. spp., Mt. Albert Edward, S.E. New Guinea; SHARPE, Bull. B. O. C. vii, p. lx.
- Munia atricapilla*, in Suffolk; *id. op. cit.* viii, p. xvii.
- Granatina hawkeri*, n. sp., S. Somaliland; LORT PHILLIPS, t. c. p. xxiii.
- Estrela jagoensis*, n. sp., Santiago, Cape Verde Islands; ALEXANDER, Ibis, 1898, p. 85.
- Otyphantes sharpii*, n. sp., Nyasaland; SHELLEY, t. c. p. 557.

Family TANAGRIDÆ.

- Many genera formerly included in the *Tanagridæ* are now placed by Mr RIDGWAY in the *Fringillidæ* [q. v.].
- Calliste pretiosa* in Argentina; SCLATER, Bull. B. O. C. viii, p. xxiv.
- Phænicothraupis rubicoides roseus*, n. subsp., W. Mexico; NELSON, P. Soc. Washington, xii, p. 60.
- Piranga faceta*, n. sp., Santa Marta, Colombia; BANGS, t. c. xii, p. 141.
- Pyranga bidentata*, Sw., distinct from *P. sanguinolenta*, Lafr.; NELSON, Auk, xv, pp. 157-159.
- Buthraupis rothschildi*, figured; HARTERT, Nov. Zool. v, pl. ii, fig. 2.
- Buarremon basilicus*, n. sp., Santa Marta, Colombia; BANGS, P. Soc. Washington, xii, p. 159.
- Nemosia rosenbergi*, figured; HARTERT, Nov. Zool. v, pl. ii, fig. 1.
- Chlorospingus olivaceiceps*, n. sp., Costa Rica; UNDERWOOD, Bull. B. O. C. vii, p. lix.
- Arremonops conirostris canens*, n. subsp., Santa Marta, Colombia; BANGS, P. Soc. Washington, xii, p. 140.
- A. venezuelensis*, n. sp., Venezuela; RIDGWAY, Auk, xv, p. 228.
- Mitrospingus*, n. g., type *M. cassini* (Lawr.); RIDGWAY, t. c. p. 225.

- Heterospingus*, n. g., type *H. rubrifrons* (Lawr.); RIDGWAY, Auk, xv, p. 225.
Lysurus, n. g., type *L. crassirostris* (Cassin); RIDGWAY, t. c. p. 225.
Pselliophorus, n. g., type *P. tibialis* (Lawr.); RIDGWAY, t. c. p. 225.
Rhodothraupis, n. g., type *R. celeno* (Licht.); RIDGWAY, t. c. p. 226.
Hemithraupis, n. g., type *H. cyanocephala* (Lafr.); RIDGWAY, t. c. p. 226.
Sporathraupis, n. n. for the preoccupied *Hemithraupis* (Ridgw. nec Cab.); RIDGWAY, t. c. pp. 330 & 331.
Stelgidostomus, n. g., type *S. maxillosus* (Cab.); RIDGWAY, t. c. p. 226.

Family CÆREBIDÆ.

- Diglossa nocticolor*, n. sp., Santa Marta, Colombia; BANGS, P. Soc. Washington, xii, p. 180.
Dacnis napea, n. sp., Santa Marta, Colombia; BANGS, t. c. xii, p. 143.
Certhidea becki, n. sp., Wenman Island, Galapagos, *C. brownei*, n. sp., Culpepper Island; ROTHSCCHILD, Bull. B. O. C. vii, p. liii.

Family FRINGILLIDÆ.

- Coccothraustes coccothraustes*, in Midlothian; CLARKE, Ann. Scott. Nat. Hist. 1898, pp. 114 & 115; nesting habits; HENRICI, Ornith. Monber. vi, pp. 163-166.
Guiraca chiapensis, n. sp., Chiapas, Mexico; NELSON, P. Soc. Washington, xii, p. 61.
Guiraca cærulea eurhyncha (Coues) = *Guiraca cærulea lazula* (Lesson); RIDGWAY, Auk, xv, p. 322.
Cyanocompsa concreta cyanescens, n. subsp. (*Guiraca cyanoides*, Auct. nec Lafr.), Panama: *C. cyanoides* (Lafr.) is from Venezuela, Guiana, and Amazonia; RIDGWAY, Auk, xv, p. 229.
C. concreta sanctæ-martæ, n. subsp., Santa Marta, Colombia; BANGS, P. Soc. Washington, xii, p. 139.
Cardinalis cardinalis mariæ, n. subsp., Tres Marias Is.; NELSON, t. c. xii, p. 10.
Fringilla cælebs, notes on the breeding; WITCHELL, Zoologist, 1898, pp. 195-197; BENSON, t. c. p. 269; PAGE, t. c. p. 270. *F. nivalis* [sc. *Montifringilla*] in Bohemia; V. TSCHUSI ZU SCHMIDHOFFEN, Ornith. Jahrb. ix, p. 71. *F. spodiogena*, in Italy; E. H. GIGLIOLI, Avicula, ii, pp. 97 & 98.
Astragalinus mexicanus jouyi, n. subsp., Yucatan; RIDGWAY, Auk, xv, p. 320.
Spinus spinescens capitaneus, n. subsp., Santa Marta, Colombia; BANGS, P. Soc. Washington, xii, p. 178.
Linaria cannabina, notes on the egg; RASPAIL, Bull. Soc. France, xxiii, pp. 94-97.
Euetheia coryi, n. sp., Cayman Brac; RIDGWAY, Auk, xv, p. 322. *E. bryanti*, n. sp., Porto Rico; *id.* t. c. p. 322.
Rhynchostruthus louisæ, figured; LORT PHILLIPS, Ibis, 1898, pl. viii.
Rhodopechys aliena, ♂, ♀ described; WHITAKER, Ibis, 1898, pp. 601 & 602.
Carpodacus, further notes on the genus by BIANCHI, J. Ornith. 1898, pp. 545-547. *C. macgregori*, young male described; MCGREGOR, Auk, xv, p. 265. *C. clementis*, n. sp., Southern California; MEARNs, Auk, xv, pp. 258-261.
Serinus punctigula, n. sp., Cameroons; REICHENOW, Ornith. Monber. vi, p. 23.
S. fagani, Sharpe = *S. reichenowi* (Salvad.); SHARPE, Ibis, 1898, p. 579.
Poliospiza pallidior, n. sp., Somaliland; LORT PHILLIPS, Ibis, 1898, p. 398.

- Serinopsis*, n. g., type *S. arvensis* (Kittlitz); RIDGWAY, Auk, xv, p. 225.
- Pinicola enucleator alascensis*, n. subsp., Alaska; RIDGWAY, Auk, xv, p. 319. *P. e. montana*, n. subsp., Montana to New Mexico; *id. t. c.* p. 319. *P. e. flammula* (Homeyer) = *P. e. kadiaka*, Ridgw.; *id. t. c.* p. 320.
- Loxia*, notes on species; STOLL, Ornith. Monber. vi, pp. 137-141. *L. curvirostra poliogyna*, n. subsp., Tunis; WHITAKER, Ibis, 1898, p. 625.
- Emberiza schoeniclus* and its allies, notes on; G. ANGELINI, Avicula, ii, pp. 121-125; G. VALLON, *t. c.* pp. 125-129.
- Emberiza schoeniclus tshusii*, n. subsp.; REISER & G. VON ALMÁSY, Aquila, v, pp. 122-124. *E. hortulana*, in Shetland; CLARKE, Ann. Scott. Nat. Hist. 1898, p. 178. *E. cirrus*, in Breconshire; SWAINSON, Zoologist, 1898, pp. 478 & 479; SAUNDERS, *t. c.* p. 505.
- Plectrophenax*, Stejn. = *Passerina*, Vieillot.; RIDGWAY, Auk, xv, p. 324.
- Calcarius lapponicus*, in Franz Josef Land; CLARKE, Ibis, 1898, pp. 255 & 256. *C. lapponicus alascensis*, n. subsp., Alaska and Aleutian Islands; RIDGWAY, Auk, xv, p. 320. *C. l. coloratus*, n. subsp., Kamtschatka; *id. t. c.* p. 320.
- Rhynchospiza*, n. g., type *R. stolzmanni* (Tacz.); RIDGWAY, Auk, xv, p. 224.
- Plagiospiza*, n. g., type *P. superciliosa* (Swains.); RIDGWAY, *t. c.* p. 224.
- Zonotrichia capensis costaricensis*, Allen = *Pyrgita peruviana*, Lesson; RIDGWAY, *t. c.* p. 321.
- Brachyspiza capensis insularis*, n. subsp., Island of Curaçoa; RIDGWAY, *t. c.* p. 321.
- Brachyspiza*, n. g., type *B. capensis* (Müller); RIDGWAY, *t. c.* p. 224.
- Ammodromus nigrescens*, notes on; CHAPMAN, Auk, xv, p. 270. *A. sanctorum*, young female described; MCGREGOR, Auk, xv, pp. 264 & 265.
- A. halophilus*, n. sp., Lower California; *id. t. c.* pp. 265-267.
- Melanospiza*, n. g., type *M. richardsoni* (Cory); RIDGWAY, Auk, xv, p. 224.
- Melospiza lincolni*, in New Brunswick; MOORE, *t. c.* pp. 189 & 190.
- Amphispiza bilineata deserticola*, n. subsp., Southern United States; RIDGWAY, Auk, xv, pp. 229 & 230. *A. belli clementea*, n. subsp., San Clemente Is., California; *id. t. c.* p. 230. *A. bilineata grisea*, n. subsp., Hidalgo, Mexico; NELSON, P. Soc. Washington, xii, p. 61. *A. nevadensis*, a distinct species from *A. belli*; GRINNELL, Auk, xv, pp. 58 & 59; A. K. FISHER, *t. c.* p. 190.
- Junco montanus*, n. sp., Montana; RIDGWAY, Auk, xv, p. 321.
- Incaspiza*, n. g., type *I. pulchra* (ScL.); RIDGWAY, *t. c.* p. 224.
- Idiopsar brachyurus*, its rediscovery in Bolivia; BERLEPSCH, Ibis, 1898, pp. 62-65.
- Atlapetes pileatus dilutus*, n. subsp., Chihuahua, Mexico; RIDGWAY, Auk, xv, p. 228.
- Myiospiza*, n. g., type *M. manimbe* (Licht.); RIDGWAY, *t. c.* p. 224.
- Pipilo carmani*, young female described; MCGREGOR, *t. c.* p. 264.
- Aimophila ruficeps sororia*, n. subsp., Lower California; RIDGWAY, *t. c.* pp. 226 & 227. *A. sartorii*, n. sp., Vera Cruz; *id. t. c.* p. 227.
- Arremonops richmondi*, n. sp. (*Embernagra striaticeps*, Auct., nec Lafr.), Honduras to Panama; RIDGWAY, *t. c.* pp. 228 & 229.
- Sycalis browni*, n. sp., Santa Marta, Colombia; BANGS, P. Soc. Washington, xii, p. 139.
- Pyrrhulagra affinis* (Baird Ms.), Island of Haiti, pp. 322 & 323: *P. dominicana*, Dominica, p. 323: *P. crissalis*, St. Vincent, p. 323: *P. coryi*, St. Eustatius, p. 323; RIDGWAY, Auk, xv: nn. spp.
- Embernagra conirostris* (Bp.) is the true *E. striaticeps* (Lafr.); RIDGWAY, *t. c.* p. 228.

Family ALAUDIDÆ.

- Chersophilus duponti*, nest and eggs described; WHITAKER, Ibis, 1898, pp. 128 & 129.
- Pseudalaemon*, n. g., type *P. fremantlii* (Lort Phillips); LORT PHILLIPS, Ibis, 1898, pp. 400 & 401, figured, pl. ix, fig. 2.
- Spizocorys razæ*, n. sp., Raza, Cape Verde Islands; ALEXANDER, *t. c.* pp. 107 & 108, pl. iii.
- Otocorys atlas*, n. sp., Marocco; WHITAKER, Bull. B. O. C. vii, p. xlvii: described and figured; *id.* Ibis, 1898, pp. 604-606, pl. xiii.
- O. alpestris* in Franz Josef Land; CLARKE, Bull. B. O. C. vii, p. xxxvi: also Ibis, 1898, p. 256.
- Alauda arvensis*, note on the sexual differences; BUTLER, Zoologist, 1898, pp. 104 & 105. *A. sala*, nest and eggs described; LA TOUCHE, Ibis, 1898, p. 368.
- Mirafra marginata*, n. sp., Somali Land; HAWKER, Bull. B. O. C. vii, p. lv.
- Galerida theklæ ruficolor*, n. subsp., Central and Southern Marocco; WHITAKER, Ibis, 1898, p. 603.
- Pyrrhulauda leucoparæa*, in British East Africa; HINDE, *t. c.* p. 579.

Family MOTACILLIDÆ.

- ALMÁSY, G. VON. Addenda zu Ornith. Ungarns. II. Über die Formen der Untergattung *Budytes*; Ornith. Jahrb. ix, pp. 83-112. [*B. flava* and allies.]
- Motacilla alba*, its migration to Ireland; SAUNDERS, Bull. B. O. C. vii, p. lviii: note on the species in Ireland; WARREN, Irish Natural. vii, pp. 160-163, and Zoologist, pp. 245-248. *M. maderaspatensis*, in captivity; NEWMHAM, J. Bombay Soc. xi, pp. 535 & 536. *M. sulphurea*, breeding in West Prussia; HOMEYER, Ornith. Monber. vi, pp. 3 & 4.
- Anthus trivialis*, near Oxford in January; WARDE FOWLER, Zoologist, 1898, pp. 122 & 123. *A. cervinus*, wintering in British East Africa; HINDE, Ibis, 1898, p. 579. *A. spipoletta* in Carnarvonshire; SAUNDERS, Bull. B. O. C. vii, p. xxvi.

Family MNIOTILTIDÆ.

- Dendroica caerulescens cairnsi*, in Georgia on migration; BANGS, Auk, xv, p. 192.
- Dendroica castanea*, in North Carolina; PEARSON, *t. c.* p. 275. *D. kirtlandi*, notes on and figured; CHAPMAN, *t. c.* pp. 289-293, pl. iv.

Family SITTIDÆ.

- Sitta pusilla caniceps*, n. subsp., Florida; BANGS, Auk, xv, pp. 180 & 181.
- S. carolinensis*, notes on its food; SANDERSON, *t. c.* pp. 144-150.
- Daphænositta miranda*, notes on; SALVADORI, Ibis, 1898, pp. 208 & 209; figured, pl. iv.

Family MELIPHAGIDÆ.

- Notes on the bird fauna of the Box Hill district; HALL, Victorian Naturalist, xiv, pp. 123-128.
- Ptilotis perstriata*, n. sp., Wharton Range, S.E. New Guinea; DE VIS, Rep. Brit. New Guinea, 1898, App. p. 86. *P. piperata*, n. sp., Vanapa

- River, S.E. New Guinea; *id. t. c.* p. 86. *P. keartlandi*, in West Australia; NORTH, Tr. R. Soc. S. Australia, xxii, pp. 148 & 149. *P. gracilis*, nest and eggs described and figured; LE SOUËF, Ibis, 1898, pl. i, pp. 56-58. *P. notata*, nest and eggs described; *id. t. c.* p. 58. *P. macleayana*, nest and eggs described; NORTH, P. Linn. Soc. N. S. Wales, xxiii, pp. 380 & 381.
- Myza sarasinorum*, figured; MEYER & WIGLESWORTH, B. Celebes, ii, pl. xxviii, fig. 1.
- Melilestes celebensis*, figured; *id. t. c.* pl. xxviii, fig. 2.
- Sarganura*, n. g., type *S. maculiceps*, n. sp., Wharton Range, S.E. New Guinea; DE VIS, Rep. Brit. New Guinea, 1898, App. p. 87.
- Stigmatops notabilis*, n. sp., Island of Wetter; FINSCH, Notes Leyden Mus. xx, pp. 131 & 132.
- Myzomela nigrita lousiadensis*, n. subsp., Sudest Is., Louisiades; HARTERT, Nov. Zool. v, pp. 527 & 528.
- M. albigula*, Rossel Is., Louisiades, *M. pallidior*, S. Aignan Is., nn. spp.; HARTERT, Bull. B. O. C. viii, pp. xx & xxi.
- M. erythrocephala*, nest and eggs described; NORTH, P. Linn. Soc. N. S. Wales, xxiii, p. 381.
- Cleptornis marchei*, Oust., eggs described, those described by Oustalet being those of a *Zosterops*; HARTERT, Nov. Zool. v, p. 56.

Family NECTARINIIDÆ.

- Æthopyga siparaja niasensis*, n. subsp., Nias Is.; HARTERT, Ornith. Monber. vi, p. 92.
- Æ. saturata*, breeding in the Chutla Bheel, Cachar; INGLIS, J. Bombay Soc. xii, p. 217. *Æ. magnifica*, egg figured; GRANT & WHITEHEAD, Ibis, 1898, pl. v, figg. 5 & 6. *Æ. bella*, egg figured; *id. t. c.* pl. v, fig. 10.
- Cinnyris bradshawi*, n. sp., Witu, East Africa; SHARPE, Ibis, 1898, p. 137.
- Hermotimia talautensis*, ♂, ♀, figured; MEYER & WIGLESWORTH, B. Celebes, ii, pl. xxvii, figg. 2 & 3.
- Cystostomus teijsmanni* ♂, ♀ (figg. 1 & 2), *C. frenatus saleyensis*, ♂ (fig. 3); MEYER & WIGLESWORTH, *t. c.* pl. xxvi.

Family DICEIDÆ.

- Dicæum celebicum*, ♂, ♀ (pl. xxv, figg. 1 & 2), *D. sangirensis* (pl. xxv, fig. 3), *D. nehrkorni* (pl. xxv, fig. 4), figured; MEYER & WIGLESWORTH, B. Celebes, ii, pl. xxv. *D. hæmatostictum*, egg figured; GRANT & WHITEHEAD, Ibis, 1898, pl. vi, fig. 2. *D. cruentatum* × *D. ignipectus*; BAKER, J. Bombay Soc. xi, p. 467.
- Acmorhynchus sangirensis*, figured; MEYER & WIGLESWORTH, B. Celebes, ii, pl. xxvii, fig. 1.
- A. annæ*, notes on; HARTERT, Nov. Zool. v, p. 117.

Family ZOSTEROPIDÆ.

- Zosterops lettiensis*, n. sp., Island of Letti; FINSCH, Notes Leyden Mus. xx, p. 136.
- Z. meeki*, n. sp., Sudest Is., Louisiades; HARTERT, Nov. Zool. v, p. 528.
- Z. squamiceps*, figured; MEYER & WIGLESWORTH, B. Celebes, ii, pl. xxix, fig. 1. *Z. babelo* (fig. 1), *Z. subatrifrons* (fig. 2), *Z. anomala* (fig. 3), figured; MEYER & WIGLESWORTH, B. Celebes, ii, pl. xxx. *Z. sarasinorum* (fig. 1), *Z. nehrkorni* (fig. 2); *id. t. c.* pl. xxxi. *Z. simplex*, figured; BUTLER, Avicult. Mag. iv, pl. to p. 201.

Family PARIDÆ.

- Parus nigracinereus*, n. sp., Nandi, Equatorial Africa; JACKSON, Bull. B. O. C. viii, p. xxii.
- P. (Lophophanes) bicolor floridanus*, n. subsp., Florida; BANGS, Auk, xv, pp. 181 & 182. *P. salicarius*, Brehm, to be added to the British List; HARTERT, Zoologist, 1898, pp. 116-118. *P. palustris* and its allies; KLEINSCHMIDT, Ornith. Monber. vi, pp. 33-36, and V. TSCHUSI ZU SCHMIDHOFFEN, Ornith. Jahrb. ix, pp. 163-176. *P. atricapillus*, notes on its food; SANDERSON, Auk, xv, pp. 150-155. *P. palustris*, curious nesting-site; DOBBIE, Ann. Scott. Nat. Hist. 1898, pp. 180 & 181.

Family LANIIDÆ.

- Food of Shrikes, JUDD, U. S. Agric. Bull. No. 9, pp. 15-26.
- Notes on the Grey Shrikes of Tunisia; J. I. S. WHITAKER, Ibis, 1898, pp. 228-231.
- Lanius ludovicianus migrans*, n. subsp., Eastern and Central North America; PALMER, Auk, xv, pp. 248-257. *L. ludovicianus anthonyi*, n. subsp., Southern California; MEARNs, Auk, xv, pp. 261-264. *L. algeriensis dodsoni*, n. subsp., Morocco; WHITAKER, Ibis, 1898, pp. 599 & 600. *L. collurio*, in Forfarshire; DEWAR, Ann. Scott. Nat. Hist. 1898, p. 180.
- Eurocephalus rueppelli*, its nest; LORT PHILLIPS, Bull. B. O. C. viii, p. xxiv.
- Colluriocincla discolor*, De Vis, ? = *Pachycephala fortis*, Gadow; HARTERT, Nov. Zool. v, p. 522.
- Pachycephala strenua*, n. sp., Wharton Range(?), S.E. New Guinea; DE VIS, Rep. Brit. New Guinea, 1898, App. p. 85.
- P. rosseliana*, n. sp., Rossel Is., Louisiade Archipelago, p. viii, *P. alberti*, n. sp., Sudest Is., p. ix; HARTERT, Bull. B. O. C. viii, pp. viii & ix.
- P. kuehni*, p. xiv, Little Kè Is.: *P. examinata*, p. xiv, Buru: *P. meeki*, p. xv, Rossel Is., Louisiade Archipelago: *P. contempta*, p. xv, Lord Howe Is., nn. spp.; HARTERT, t. c.
- P. teijsmanni*, *P. everetti*, figured; MEYER & WIGLESWORTH, B. Celebes, pl. xvii, figg. 2 & 3. *P. lineolata* and *P. griseonota*, notes on; HARTERT, Nov. Zool. v, p. 131. *P. bonensis* and *P. sulfuriventer* (pl. xviii, figg. 1 & 2), *P. bonthaina* (pl. xix, figg. 1 & 2); MEYER & WIGLESWORTH, B. Celebes, ii.
- Hyloterpe philippinensis*, egg figured; GRANT & WHITEHEAD, Ibis, 1898, pl. v, fig. 1.
- Pteruthius aeralatus*, young male described; RICKETT & LA TOUCHE, Ibis, 1898, p. 330.
- Eopsaltria magnirostris*, note on; CAMPBELL, Victorian Natural. xv, p. 12.
- Maclophus rex*, ♂, ♀, young described; RICKETT & LA TOUCHE, Ibis, 1898, p. 330.
- Eulacestoma nigritorquis*, young described; GRANT, Bull. B. O. C. viii, p. x.
- Strepera rosa-alba* (De Vis) = *Cracticus lousiadensis*, Tristr.; HARTERT, Nov. Zool. v, p. 522.

Family AMPELIDÆ.

- Ampelis garrula*, notes on the species in Hungary by the late J. S. Petényi; C. SCÖRGEY, Aquila, v, pp. 213-226, pl. i.

Family VIREONIDÆ.

- Vireo nanus*, n. sp., Michoacan, Mexico; NELSON, P.Soc. Washington, xii, p. 59.
V. hypochryseus sordidus, n. subsp., Tres Marias Is.; *id. t. c.* p. 10. *V. philadelphicus*, breeding in Ontario; YOUNG, Auk, xv, pp. 191 & 192.
V. huttoni obscurus, nesting-habits, in Washington Territory; C. W. & J. H. BOWLES, *t. c.* pp. 138-140.
Cyclorhis flavipectus canticus, n. subsp., Santa Marta, Colombia; BANGS, P. Soc. Washington, xii, p. 142.

Family SYLVIIDÆ.

- Sylvia atricapilla gularis*, n. subsp., Santiago, Cape Verde Islands; ALEXANDER, Ibis, 1898, pp. 81 & 82. *S. hortensis*, on the Yenisei; POPHAM, *t. c.* p. 496: South of the Grampians; PATTERSON, Ann. Scott. Nat. Hist. 1898, p. 114. *S. nisoria*, in Lincolnshire; CATON HAIGH, Bull. B. O. C. viii, p. vi.
Acanthopneuste floris, n. sp., Flores; HARTERT, Nov. Zool. v, p. 114. *Cryptolopha sarasinorum*, Meyer & Wigglesworth is an *Acanthopneuste*; *id. t. c.* p. 114.
Phylloscopus rufus and *P. sibilatrix*, breeding in East Renfrewshire; PATERSON & ROBERTSON, Ann. Scott. Nat. Hist. 1898, p. 115. *P. viridanus*, in Russia; MENZBIER, Ornith. Jahrb. ix, pp. 1-7.
Acrocephalus mariannæ (Tristr.) should be called *A. lusciniæ* (Q. & G.); HARTERT, Nov. Zool. v, p. 57. *A. aquaticus*, in Holland; DE GRAF, Tijdschr. Nederl. Dierk. (2) 1898, p. 303. *A. palustris*, notes on the nesting in Oxfordshire; WARDE FOWLER, Zoologist, 1898, pp. 356-358.
Cettia everetti, n. sp., Timor; HARTERT, Nov. Zool. v, p. 113. *C. sinensis*, n. sp., Fohkien; LA TOUCHE, Bull. B. O. C. vii, p. xxxvii. *C. russula*, Slater, is a *Lusciniola*; GRANT, *t. c.* p. x.
Lusciniola schwarzi, in Lincolnshire [first time in Europe]; CATON HAIGH, *t. c.* p. vi. *L. melanorhyncha*, n. sp., N.W. Fohkien; RICKETT, *t. c.* p. x.
Apalis viridiceps, n. sp., Somali Land; HAWKER, *op. cit.* vii, p. lv.
Phyllergates riedeli, figured; MEYER & WIGLESWORTH, B. Celebes, ii, pl. xxxiv, fig. 1.
Phylloscopus tristis on the River Po, Italy. F. ODOARDO, Avicula, ii, pp. 1 & 2.
Calamocichla brevipennis, its nest; ALEXANDER, Bull. B. O. C. vii, p. xxvii.
Euprinodes florisuga (Licht.) distinct from *E. flavocinctus* and *E. goltzi*; REICHENOW, J. Ornith. 1898, p. 314.

Family TURDIDÆ.

- Monograph of the *Turdidæ* or family of Thrushes. By HENRY SEEBOHM (edited after the author's death by R. BOWDLER SHARPE), London, 1898, 4to, pts. I-V. 43 species of *Geocichla* and 44 of *Turdus* are figured.
Geocichla erythronota, skeleton figured; MEYER, Vogel-Skel. Lief. xxii, Taf. cxcvii.
Turdus cinerascens, n. sp., German East Africa; REICHENOW, Ornith. Monber. vi, p. 82.
T. musicus, notes on the immigration; PICKARD-CAMBRIDGE, Zoologist, 1898, pp. 264 & 265. *T. aliciae bicknelli*, on Mt. Ktaadn, Maine; ALLEN, Auk, xv, pp. 60 & 61. *T. pilaris* × *T. iliacus*; COLLETT, P. Zool. Soc. Lond. 1898, p. 3, figured; COLLETT, Ibis, 1898, pp. 316-319, pl. vii. *T. nigrorum*, egg figured; GRANT & WHITEHEAD, *t. c.* pl. v, figg. 8 & 9. *T. tristis*, distinct from *T. leucauchen*; SHARPE, Bull. B. O. C. vii, p. xxvi.

- Hylocichla ustulata almæ*, n. subsp., Rocky Mountain Region to Mexico; OBERHOLSER, Auk, xv, pp. 304 & 305.
- Merula atrigularis*, near Rome; G. FALCONIERI DI CARPEGNA, Avicula, ii, pp. 2 & 3.
- Merula incompta*, n. sp., Santa Marta, Colombia; BANGS, P. Soc. Washington, xii, p. 144.
- M. phaeopyga minuscula*, n. subsp., Santa Marta, Colombia; BANGS, P. Soc. Washington, xii, p. 181. *M. gigas cacozele*, n. subsp., Santa Marta, Colombia; *id. t. c.* p. 181. *M. tristis assimilis*, n. subsp., Jalapa, Mexico; CHAPMAN, Bull. Amer. Mus. x, pp. 19 & 20. *M. celebensis*, ad. et juv. figured; MEYER & WIGLESWORTH, B. Celebes, ii, pl. xxxv. *M. migratoria*, notes on the breeding habits, in Massachusetts; HOWE, Auk, xv, pp. 162-167.
- Calliope davidi*, n. sp., Setchuan; OUSTALET, Bull. Mus. Paris, 1898, pp. 222 & 223.
- Monticola angolensis*, in Mashona Land; SHARPE, Bull. B. O. C. vii, p. xxxvi.
- Petrocinella* ? n. gen. type *P. cyanea* (Linn.), near Castelvetro, Sicily; F. VENEZIA, Avicula, ii, p. 35.
- Sialia sialis grata*, n. subsp., Florida; BANGS, Auk, xv, pp. 182 & 183.
- Saxicola caterinae*, n. sp., Algeria and Marocco; WHITAKER, Ibis, 1898, pp. 624 & 625.
- S. mæsta*, nest and eggs described; *id. t. c.* pp. 129-132. *S. albicollis* and *S. amphileuca*, notes on; REISER, Aquila, v, pp. 293 & 294; HERMANN, *t. c.* p. 294. *S. seebohmi*, notes on; WHITAKER, Ibis, 1898, pp. 595 & 596. *S. chrysopygia*, breeding near the Kurram Valley; RATTRAY, J. Bombay Soc. xii, pp. 225 & 226. *S. ananthe*, on Waigats Island; PEARSON, Ibis, 1898, p. 191. *S. aurita* and *S. melanoleuca*, in Hungary; MADARASZ, Termes. Fuzetek, xxi, pp. 473-479.
- Pratincola maura*, in Borneo; SHELFORD, Ibis, 1898, p. 458. *P. rubetra*, in Shetland; CLARKE, Ann. Scott. Nat. Hist. 1898, p. 178.

Family CINCLIDÆ.

- Cinclus marila*, notes on, and young described; LA TOUCHE, Ibis, 1898, p. 362.

Family TROGLODYTIDÆ.

- Thryomanes*. A revision of the genus; OBERHOLSER, P. U. S. Mus. xxi, pp. 421-450; *T. bewickii cryptus*; *T. b. eremophilus*; *T. b. percusus*; *T. b. charienturus*; *T. b. drymæcus*; *T. b. calophonus*; *T. b. nesophilus*, n. subsp.
- Thryothorus lætus*, n. sp., Santa Marta, Colombia; BANGS, P. Soc. Washington, xii, pp. 160, 180. *T. lawrencii magdalenæ*, n. subsp., Tres Marias Is.; NELSON, *t. c.* p. 11.
- Cistothorus palustris*, in New Brunswick; MOORE, Auk, xv, p. 192.
- Salpinctes obsoletus pulverius*, n. subsp., California; GRINNELL, *t. c.* pp. 238 & 239.
- Heleodytes brunneicapillus obscurus*, n. subsp., Hidalgo, Mexico; NELSON, P. Soc. Washington, xii, p. 58.
- Hemiura leucogaster*, note on; FAXON, Auk, xv, p. 60.
- Heleodytes occidentalis*, Nelson = *H. gularis* (Scl.); NELSON, *t. c.* p. 160.
- Elachura punctata*, in China; RICKETT & LA TOUCHE, Ibis, 1898, p. 331.

Family MIMIDÆ.

- Nesomimus hulli*, n. sp., Culpepper Island, Galapagos; ROTHSCILD, Bull. B. O. C. vii, p. liii. *N. affinis*, n. sp., Narborough Island, Galapagos; *id. t. c.* p. liii. *N. barringtoni* [mispr. *carringtoni*, R. B. S.], n. sp.; *id. t. c.* p. vii.
- Harporhynchus redivivus pasadenensis*, n. subsp., Southern California; GRINNELL, Auk, xv, p. 237. *H. curvirostris palmeri*, notes on the nesting; CLARK, *t. c.* pp. 272-274.
- Melanotis cærulescens longirostris*, n. subsp., Tres Marias Is.; NELSON, P. Soc. Washington, xii, p. 10.

Family TIMELIIDÆ.

- Brachypteryx carolinæ*, n. sp., N.W. Fohkien; LA TOUCHE, Bull. B. O. C. viii, p. x.
- Cittocincla luzoniensis*, egg figured; GRANT & WHITEHEAD, Ibis, 1898, pl. vi, fig. 4.
- Stipiturus malachurus*, notes on the nidification; SHEPHERD, Victorian Natural. xiv, pp. 140-142.
- Prinia inornata*, nest and eggs described; LA TOUCHE, Ibis, 1898, pp. 360 & 361.
- Cisticola hindii*, figured; HINDE, *t. c.* pl. xii, fig. 2.
- Sericornis magnirostris*, geographical distribution; CAMPBELL, Victorian Natural. xv, p. 160.
- Megalurus ruficeps*, egg figured; GRANT & WHITEHEAD, Ibis, 1898, pl. v, fig. 7.
- Crateropus wickenburgi*, n. sp., Somali Land; VON LORENZ, Orn. Monber. vi, p. 27 [= *Heteropsar albicapillus* (Blyth); *id. op. cit.* vii, p. 27].
- Trochalopteron styani*, n. sp., China; OUSTALET, Bull. Mus. Paris, 1898, p. 226.
- T. hennickei*, n. sp., Upper Valley of the Yang-tse; PRAZAK, Monatsb. Deuts. Ver. Schutze Vogelw. xxii, p. 237.
- T. taivanum*, nest and eggs described; LA TOUCHE, Ibis, 1898, pp. 357 & 358.
- Garrulax schmackeri*, n. sp., Hainan; HARTLAUB, Abh. Ver. Bremen, xiv, pp. 349 & 350, 380-383, Taf. iv.
- Ifrita*, n. gen., type *I. coronata*, n. sp., S.E. New Guinea; ROTHSCILD, Bull. B. O. C. vii, p. liv.
- Malia grata recondita*, figured; MEYER & WIGLESWORTH, B. Celebes, ii, pl. xxxiii.
- Androphilus castaneus*, figured; *id. t. c.* pl. xxxiv, fig. 2.
- Rectirostrum zenkeri*, n. sp., Cameroons; REICHENOW, Ornith. Monber. vi, pp. 22 & 23.
- Cataponera turdoides*, figured; MEYER & WIGLESWORTH, B. Celebes, ii, pl. xxix, fig. 2.
- Turdinus stierlingi*, n. sp., Uhehe, German East Africa; REICHENOW, Ornith. Monber. vi, p. 82.
- Turdinulus murinus* (Blyth) and *T. exul*, Sharpe, probably the same as *T. epilepidotus* (Temm.); FORBES, Bull. Liverp. Mus. i, pp. 83 & 84.
- Stachyridopsis ruficeps*, nestling described; LA TOUCHE, Ibis, 1898, pp. 358 & 359.
- Yuhina pallida*, young described; RICKETT & LA TOUCHE, *t. c.* p. 331.
- Ephthianura crocea*, nest and eggs described; NORTH, P. Linn. Soc. N. S. Wales, xxiii, p. 380.

Family PYCNONOTIDÆ.

- Chloropsis zosterops parvirostris*, n. subsp., Nias Is.; HARTERT, Ornith. Monber. vi, p. 93.
- Hypsipetes nigerrimus*, nest and eggs described; LA TOUCHE, Ibis, 1898, p. 365.
- Hemixus canipennis*, young described; RICKETT & LA TOUCHE, t. c. p. 332.
- Iole tickelli peracensis*, n. subsp., Perak, Malay Peninsula; HARTERT & BUTLER, Nov. Zool. v, p. 506. *I. aurea* (fig. 1) and *I. platenæ*, figured; MEYER & WIGLESWORTH, B. Celebes, ii, pl. xxxii. *I. holti*, young ♂ described; RICKETT & LA TOUCHE, Ibis, 1898, p. 331. *I. mindorensis*, egg figured; GRANT & WHITEHEAD, t. c. pl. v, fig. 2.
- Pycnonotus sinensis*, nest and eggs described; LA TOUCHE, t. c. pp. 365 & 366.

Family CAMPOPHAGIDÆ.

- Graucalus floris alfredianus*, n. subsp., Alor Is.; HARTERT, Nov. Zool. v, p. 458. *G. hypoleucus lousiadensis*, n. subsp., Sudest Is., Louisiades; *id.* t. c. p. 524. *G. bicolor*, ♂ ♀ (pl. xx, figg. 1 & 2), *G. leucopygius*, ad. et juv. (pl. xxi), figured; MEYER & WIGLESWORTH, B. Celebes, vol. ii, pls. xx & xxi.
- Edolisoma obiense*, ♀ ♂ (pl. xxii, figg. 1, 4), *E. talautense*, ♀ ♂ (pl. xxii, figg. 2, 6), *E. morio*, ♀ ♂ (pl. xxii, figg. 3, 5), figured; *id.* t. c. vol. ii. *E. salvadorii*, ♂ ♀, figured; *id.* t. c. pl. xxiii. *E. rostratum*, n. sp., Rossel Is., Louisiades; HARTERT, Bull. B. O. C. viii, p. xx. *E. amboinense tagularum*, n. subsp., Sudest Is., Louisiades; HARTERT, Nov. Zool. v, p. 524. *E. morio septentrionalis*, n. subsp., N. Celebes; MEYER & WIGLESWORTH, B. Celebes, p. 420. *E. obiense*, from the Sula Is., notes on; HARTERT, Nov. Zool. v, p. 132. *E. cærulescens*, egg figured; GRANT & WHITEHEAD, Ibis, 1898, pl. vi, fig. 3.

Family MUSCICAPIDÆ.

- Muscicapa parva*, in Bosnia; SCHALOW, Ornith. Monber. vi, pp. 181 & 182: notes on the species; HELLMAYR, Ornith. Jahrb. ix, pp. 219–221: in Bavaria; PARROT, J. Ornith. 1898, pp. 57–59. *M. atricapilla*, in Shetland; CLARKE, Ann. Scott. Nat. Hist. 1898, p. 178: in Mid-Nithsdale; ARMSTRONG, Ann. Scott. Nat. Hist. 1898, p. 49.
- Petræca campbelli*, n. sp., W. Australia; SHARPE, Bull. B. O. C. viii, p. xxii.
- Muscicapula hyperythra*, figured; MEYER & WIGLESWORTH, B. Celebes, pl. xiii. *M. samarensis*, egg figured; GRANT & WHITEHEAD, Ibis, 1898, vi, fig. 6. *M. westermanni* and *M. melanoleuca*, notes on; FINSCH, Notes Leyden Mus. xx, pp. 93–96.
- Gerygone wetterensis*, n. sp., Island of Wetter; FINSCH, Notes Leyden Mus. xx, p. 132. *G. kisserensis*, n. sp., Island of Kisser; *id.* t. c. pp. 133 & 134. *G. pallida*, n. sp., Lobo Bay, West Coast, New Guinea; *id.* t. c. pp. 134 & 135 (ex Temm. Mss.). *G. robusta*, n. sp., Wharton Range, S.E. New Guinea; DE VIS, Rep. Brit. New Guinea, 1898, App. p. 84. *G. personata*, nest and eggs described; LE SOUËF, Ibis, 1898, p. 59.
- Pseudogerygone virescens*, n. sp., Lobo Bay, West Coast, New Guinea; FINSCH, Notes Leyden Mus. xx, pp. 135 & 136 (ex S. Müller Mss.).
- Polioptila schistaceigula*, n. sp., N. Ecuador; HARTERT, Bull. B. O. C. vii, p. xxx.
- P. mexicana*, notes on; NELSON, Auk, xx, pp. 160 & 161.

- Erythrocerus francisci*, n. sp., Inhambane; SCLATER, Bull. B. O. C. vii, p. lx.
- Bathmisyrma rufum*, ♂ figured; REICHENOW, J. Ornith. 1898, Taf. i, fig. 2.
- Hypothymis puella blasii*, n. subsp., Sula Is.; HARTERT, Nov. Zool. v, p. 131.
- Rhipidura saipanensis*, n. sp., Saipan Is., Mariannes; HARTERT, Nov. Zool. v, p. 54. *R. latiscapa*, n. sp., Wharton Range, S.E. New Guinea; DE VIS, Rep. Brit. New Guinea, 1898, p. 83. *R. atrigularis*, Reichenow = *R. urania*, Oustalet; HARTERT, Nov. Zool. v, p. 53. *R. astrolabi*, Oust., Vanikoro Is., notes on; *id. t. c.* p. 54. *R. setosa nigromentalis*, n. subsp., Sudest Is., Louisiades; HARTERT, Nov. Zool. v, p. 525.
- Zeocephus talautensis*, figured; MEYER & WIGLESWORTH, B. Celebes, pl. xvi, figg. 1-3. *Z. rufus*, egg figured; GRANT & WHITEHEAD, Ibis, 1898, pl. v, 4.
- Rhinomyias colonus*, n. sp., Sula Is.; HARTERT, Nov. Zool. v, p. 131. *R. albigularis*, egg figured; GRANT & WHITEHEAD, Ibis, 1898, pl. v, fig. 3.
- Cryptolopha sinensis*, n. sp., Fohkien; RICKETT, Bull. B. O. C. vii, p. xxxvi; Ibis, 1898, p. 332. *C. intermedia*, n. sp., Fohkien; LA TOUCHE, Bull. B. O. C. vii, p. xxxvii. *C. butleri*, n. sp., Perak; HARTERT, Bull. B. O. C. vii, p. 1.
- C. sarasinorum*, figured; MEYER & WIGLESWORTH, B. Celebes, pl. xix, fig. 3: it is an *Acanthopneuste* [*Sylviidae*]; HARTERT, Nov. Zool. v, p. 114.
- Arses lauterbachii*, ♀ figured; REICHENOW, J. Ornith. 1898, Taf. i, fig. 1.
- Monarcha commutatus* (pl. xvi, fig. 1) and *M. everetti* (pl. xvii, fig. 1), figured; MEYER & WIGLESWORTH, B. Celebes.
- Myiagra myota*, n. sp., Sudest Is., Louisiades; HARTERT, Nov. Zool. v, p. 526.
- M. latirostris*, nest and eggs described; LE SOUËF, Ibis, 1898, pp. 53 & 54.
- Stoparola septentrionalis*, figured; MEYER & WIGLESWORTH, B. Celebes, pl. xv.
- Siphia banyumas* (fig. 1), *S. djampeana* (fig. 2), *S. kalaoensis* (fig. 3), figured; *id. t. c.* pl. xiv.

Family HIRUNDINIDÆ.

- Notes on generic names of certain Swallows; COUES, Auk, xv, pp. 271 & 272.
- Chelidon urbica*, date of its arrival; WARDE FOWLER, Zoologist, 1898, pp. 267-269; POWER, *t. c.* pp. 317 & 318; D'URBAN, *t. c.* pp. 433-435.
- C. cashmeriensis*, in China; RICKETT & LA TOUCHE, Ibis, 1898, p. 328.
- Lecythoplastes*, n. gen., type *L. preussi*, n. sp., Cameroons; REICHENOW, Ornith. Monber. vi, pp. 115 & 116.
- Tachycineta bicolor*, nesting instincts; CHAPMAN, Auk, xv, p. 271.
- Hirundo rustica*, in Negros, Philippines; CLARKE, Ibis, 1898, p. 121.
- H. javanica*, skeleton figured; MEYER, Vogel-Skel. Lief. xxii, Taf. ccxiii.
- Progne sinaloa*, n. sp., Sinaloa, Mexico; NELSON, P. Soc. Washington, xii, p. 59.

Family TYRANNIDÆ.

- Elaenia browni* and *E. sororia*, nn. spp., Santa Marta, Colombia; BANGS, P. Soc. Washington, xii, pp. 158 & 175.
- Myiopagis placens minimus*, n. subsp., Tres Marias Is.; NELSON, P. Soc. Washington, xii, p. 9.
- Platypsaris aglaia*, nest figured; CHAPMAN, Bull. Amer. Mus. x, pl. iii.

Capsiempis flaveola magnirostris, n. subsp., N.W. Ecuador; HARTERT, Nov. Zool. v, p. 487.

Tyrannulus brunneicapillus is an *Ornithion*; HARTERT, Nov. Zool. v, p. 487.

Myiarchus crinitus boreus, n. subsp., Eastern North America; BANGS, Auk, xv, pp. 179 & 180. *Tyrannus tyrannus vexator*, n. subsp., Florida; BANGS, t. c. pp. 178 & 179. *T. tyrannus*, unusual nesting site; KENNARD, t. c. p. 268. *T. cubensis*, n. n. for *T. magnirostris*, d'Orb. nec Swains.; RICHMOND, t. c. p. 330.

Family COTINGIDÆ.

Heteropelma rosenbergi, n. sp., N.W. Ecuador; HARTERT, Nov. Zool. v, p. 489.

Pipra mentalis minor, n. subsp., N.W. Ecuador; HARTERT, t. c. p. 489. *P. opalizans*, notes on, and figured; BERLEPSCH, Ibis, 1898, pp. 60-62, pl. ii.

Family PITTIDÆ.

Pitta meeki, n. sp., Rossel Is., Louisiades; ROTHSCILD, Bull. B. O. C. viii, p. vi. *P. dohertyi*, n. sp., Sula Mangoli; *id. op. cit.* vii, p. xxxiii.

P. novæ hiberniæ, remarks on; *id. t. c.* p. vii. *P. concinna everetti*, n. subsp., Alor Is.; HARTERT, Nov. Zool. v, p. 459.

Serilophus rothschildi, n. sp., Perak; HARTERT, Bull. B. O. C. vii, p. 1.

Family DENDROCOLAPTIDÆ.

Muscisaxicola capistrata, in East Tierra del Fuego; SCHALOW, J. Ornith. 1898, p. 310.

Automolus rufipectus, n. sp., Santa Marta, Colombia; BANGS, P. Soc. Washington, xii, p. 158. *A. nigricauda*, n. sp., N. Ecuador; HARTERT, Bull. B. O. C. vii, p. xxx.

Picolaptes saturator, n. sp., Guatemala; UNDERWOOD, t. c. p. lix.

Dendrocinclæ olivacea anguina, n. subsp., Santa Marta, Colombia; BANGS, P. Soc. Washington, xii, p. 138.

Family FORMICARIDÆ.

Formicarius analis destructus, n. subsp., N.W. Ecuador; HARTERT, Nov. Zool. v, p. 493.

Pyriglena berlepschi, n. sp., N. Ecuador; HARTERT, Bull. B. O. C. vii, p. xxix.

Myrmotherula viduata, n. sp., N.W. Ecuador; HARTERT, Nov. Zool. v, p. 492.

Cercomacra rosenbergi, n. sp., N. Ecuador; HARTERT, Bull. B. O. C. vii, p. xxix.

Thamnophilus cachabiensis, n. sp., N. Ecuador; HARTERT, t. c. p. xxix.

T. bricenoi, n. sp., Venezuela, allied to *T. doliatus* of Cayenne (pl. iv, fig. 2); HARTERT, Nov. Zool. v, p. 220, pl. iv, fig. 1.

Grallaria ochraceiventris, n. sp., W. Mexico; NELSON, P. Soc. Washington, xii, p. 62.

G. spatiator, n. sp., Santa Marta, Colombia; BANGS, t. c. p. 177.

IV. REPTILIA AND BATRACHIA.

BY

G. A. BOULENGER, F.R.S.

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II. FAUNÆ.

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Bismarck Archipelago (New Britain and New Ireland). F. WERNER, Zool. Anz. xxi, pp. 552-556, enumerates the Reptiles and Batrachians.

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III. REFERENCES ARRANGED SYSTEMATICALLY.

REPTILIA AND BATRACHIA.

- E. C. CASE, J. Geol. vi, pp. 500-523, 622-646, 711-736, contributes a series of elementary articles on the development and geological relations of the fossil Batrachians and Reptiles.
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REPTILIA.

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- J. VERSLUYS, in an 'Inaugural Dissertation' published in Jena, 1898 (247 pp., 8 pls.), deals with the middle and outer ear of Lizards and Rhynchocephalians.
- F. MAURER, Morphol. Jahrb. xxvi, pp. 1-60, pls. i-iii, investigates the development of the ventral musculature of the trunk in Reptiles.
- H. LEVY, Jena. Zeitschr. xxxii, pp. 313-346, pl. xi, writes on the structure and development of the teeth of Reptiles.
- L. WILL, Sitzb. Akad. Berl. 1898, pp. 609-618, remarks on gastrulation in *Tropidonotus natrix*.

SQUAMATA.

- G. RETZIUS, *Biol. Untersuch.* (2) viii, pp. 105–113, pls. xxv–xxix, investigates the development of the elements of the spinal cord in *Anguis* and *Tropidonotus*.
- A. PRENANT, *J. Anat. Physiol.* xxxiv, pp. 433–462, pls. x–xii, describes an organ, comparable to the hypochorda, in embryos of Lizards and Snakes.
- P. VERDUN, *C.R. Soc. Biol.* (10) v, pp. 1046–1048, has a note on the branchial glandules and the post-branchial glands of Lizards and Snakes.

LACERTILIA.

- E. GAUPP, *Ber. Ges. Freiburg*, x, pp. 302–316, has a preliminary communication on the development of the Lacertilian skull.
- E. GAUPP, *Verh. Anat. Ges.* xii, pp. 157–163, writes on the primordial skull of *Lacerta agilis*.
- J. JANOŠÍK, *Bibliog. Anat.* vi, pp. 192–205, pls. i–v, has observations on the development of *Lacerta agilis*.
- F. HOCHSTETTER, *Morphol. Jahrb.* xxvi, pp. 213–273, figg., pls. v–vii, has a paper on the arteries of the digestive tract in Lizards.
- F. MAURER, *Verh. Anat. Ges.* xii, pp. 256–261, writes on the visceral clefts of Lizards.
- H. H. BRINDLEY, *J. Bomb. Soc.* xi, pp. 680–689, pl., remarks on abnormally reproduced tails of Lizards.
- W. SAVILLE-KENT, *Nature*, lvii, pp. 341 & 365, figg., has further notes on bipedal locomotion in certain Lizards.
- On the blood-temperature of *Tiliqua gigas*: C. MÜLLER, *Zool. Garten*, xxxix, p. 215.

GECKONIDÆ.

- Gymnodactylus louisiadensis*, De Vis. Note by BOULENGER, *Ann. Mus. Genova* (2) xviii, p. 695; *G. lorix*, sp. n., *id. ibid.* pl. vi, *Brit. New Guinea*.
- Gonatodes penangensis*, S. Flower, = *Cyrtodactylus affinis*, Stol. S. FLOWER, *P. Z. S.* 1898, p. 455.
- Ptyodactylus hasselquistii*, Donnd., var. n. *ragazzii*, ANDERSON, *Faun. Egypt*, i, p. 69, pl. vii, figg. 10 & 11, *Erythræa* and *Shoa*.
- Hemidactylus gleadowii*, Murray, = *H. brookii*, Gray. BOULENGER, *Ann. Nat. Hist.* (7) i, 123.
- Elasmodactylus namaquensis*, sp. n., W. L. SCLATER, *Ann. S. Afr. Mus.* i, p. 109, pl. v, fig. 2, *Namaqualand*.

AGAMIDÆ.

- Japalura mitsukurii*, sp. n., STEJNEGER, *J. Coll. Japan*, xii, p. 218, *Botel Tobago Id.*, near *Formosa*.
- Agama bottegi*, sp. n., BOULENGER, *Ann. Mus. Genova* (2) xviii, p. 717, pl. ix, fig. 1, *Somaliland*.
- Phrynocephalus rossikowi*, sp. n., NIKOLSKY, *Annuaire Mus. St. Petersb.* 1898, p. 286, *Mt Chen-tan*, near *Nukuss*, *Amu Daria*.

IGUANIDÆ.

- Anolis peraccae*, p. 108, pl. x, fig. 1, *elegans*, p. 109, pl. x, fig. 2, *chloris*, p. 110, pl. x, fig. 3, *maculiventris*, p. 111, pl. xi, fig. 1, *granuliceps*, p. 111, pl. xi, fig. 2, *gracilipes*, p. 112, pl. xi, fig. 3, and *lemmiscatus*, p. 113, pl. x, fig. 4, spp. nn.: BOULENGER, P. Z. S. 1898, Ecuador.
- Liosaurus catamarcensis*, sp. n., KOSLOWSKY, Rev. Mus. La Plata, viii, p. 169, Catamarca, Argentina.
- Liolaemus dorbignyi*, p. 174, Catamarca, *boulengeri*, p. 176, Chubut and Neuquen, *rothi*, p. 177, Neuquen, and *ornatus*, p. 178, Jujuy, spp. nn., KOSLOWSKY, t. c.
- Phymaturus patagonicus*, sp. n., KOSLOWSKY, t. c. p. 184, Chubut, Patagonia.
- Iguana tuberculata*, Laur. On its habits in confinement: SEYSCHAB, Zool. Garten, xxxix, p. 283.
- Ctenosaura palearis*, sp. n., STEJNEGER, P. U. S. Mus. xxi, p. 381, Gualan, Guatemala.
- Sceloporus obscurus*, sp. n., VAN DENBURGH, P. Ac. Philad. 1897, p. 462, Tepic, Jalisco, Mexico.

ANGUIDÆ.

- Gerrhonotus*, Wgm. Remarks on the distinctive characters of the forms known from the western parts of the United States: VAN DENBURGH, P. Ac. Philad. 1898, p. 63.
- Ophisaurus apus*, Pall. Notes on the mode of feeding: HANAU, Zool. Garten, xxxix, p. 51.

HELODERMATIDÆ.

- J. VAN DENBURGH, Tr. Amer. Philos. Soc. (2) xix, pp. 199-220, gives an account of his experiments with the saliva of *Heloderma suspectum*, Cope.

VARANIDÆ.

- Varanus hoffmanni*, sp. n. (foss.), O. ROGER, Ber. Ver. Augsburg, xxxiii, p. 388, Miocene of Stätzling, near Augsburg.

TEIIDÆ.

- Centropyx viridistriga*, Blgr. Note by BOULENGER, Ann. Mus. Genova (2) xix, p. 125.

AMPHISBÆNIDÆ.

- K. PETER, Morphol. Jahrb. xxv, pp. 607-612, compares the skull of the Amphisbænians with that of the Cæcilians.
- Blanus aporus*, sp. n., WERNER, Zool. Anz. xxi, p. 220, Cilician Taurus.
- Amphisbæna darwini*, D. & B. On its oviposition: C. BERG, Verh. Ges. Deutsch. Naturf. lxix, p. 164; *A. mattogrossensis*, sp. n., PERACCA, Boll. Mus. Torino, xiii, No. 326, fig., Matto Grosso, Brazil.
- Trogonophis wiegmanni*, Kaup. On its habits in confinement: SCHNEE, Zool. Garten, xxxix, p. 350.

LACERTIDÆ.

- Lacerta muralis*, Laur. On its habits in confinement: HORNUNG, Zool. Garten, xxxix, p. 184; *L. derjugini*, sp. n., NIKOLSKY, Annuaire Mus. St. Petersb. 1898, p. 284, near Artwin, Transcaucasia.
- Nucras delalandii*, M.-Edw., var. n. *bedriagai*, WERNER, Jahresber. Ver. Magdeburg, 1896-98, p. 141, Cape Colony.
- Latastia hardeggeri*, Stdr. Note by BOULENGER, Ann. Nat. Hist. (7) ii, p. 130; *L. phillipsii*, sp. n., *id. ibid.* p. 131, Somaliland.
- Holaspis guentheri*, Gray. Note by BETHENCOURT-FERREIRA, J. Sci. Lisb. (2) v, p. 242.

SCINCIDÆ.

- Lygosoma mivarti*, Blgr., and *callistictum*, Ptrs. & Dor. Notes by MÉHELY, Termes. Fuzetek, xxi, pp. 169 & 170; *L. himalayanum*, Gthr., var. n. *tragbulense*, ALLCOCK, Rep. N. H. Res. Pamir Bound. Comm. p. 36, pl. ii, fig. 1, Tragbal Pass, Pamirs; *L. loriae*, p. 698, pl. vii, fig. 1, *annectens*, p. 698, pl. vii, fig. 2, and *nigrigulare*, p. 700, pl. vii, fig. 3, spp. nn., BOULENGER, Ann. Mus. Genova (2) xviii, Brit. New Guinea; *L. ferrandii*, sp. n., *id. ibid.* p. 718, pl. ix, fig. 2, Somaliland; *L. mundivense*, sp. n., BROOM, P. Linn. Soc. N. S. Wales, xxii, p. 643, N. Queensland; *L. (Keneuxia) dahlui*, sp. n., WERNER, Zool. Anz. xxi, p. 552, Mioko, Bismarck Archipelago; *L. (Einoa) impar*, sp. n., WERNER, *t. c.* p. 553, Ralum and Mioko, Bismarck Archipelago.
- Ablepharus boutonii*, Desj. Notes by BOULENGER, Ann. Mus. Genova (2) xviii, p. 702 & 719.
- Chalcides bottegi*, sp. n., BOULENGER, *t. c.* p. 719, pl. x, fig. 1, Brit. E. Africa.
- Eumeces blythianus*, And. On a specimen from the Afridi Country: F. FINN, P. As. Soc. Beng. 1898, p. 189.
- Scelotes occidentalis*, Ptrs., redescribed by WERNER, Verh. Ges. Wien, xlviii, p. 529.

OPHIDIA.

- O. BOETTGER brings out a list of the Snakes in the Museum at Frankfort-on-the-Main, Katal. Rept. Mus. Senckenb. ii (Frankfort-on-the-Main, 1898).
- G. S. WEST, J. Linn. Soc. xxvi, pp. 517-526, pls. xxxiv & xxxv, writes on the histology of the salivary, buccal, and Harderian glands of the *Colubridæ*, and on their tooth-succession and the relationship of the poison-duct.
- G. E. BEYER, Amer. Nat. xxxii, pp. 17-24, has notes on the life-histories of various North American Snakes.
- J. J. QUELCH, Timehri (2) xii, pp. 26-36, has notes on the habits of the poisonous Snakes of British Guiana.
- On the pairing of European Snakes in the summer and autumn: ROLLINAT, Bull. Soc. zool. France, xxiii, p. 59, and C.R. Soc. Biol. (10) v, p. 56: TROUSSERT, *t. c.* p. 57.
- J. PALACKÝ, Mém. Soc. zool. France, xi, pp. 88-125, discusses the geographical distribution of the Ophidians.

TYPHLOPIDÆ.

- Typhlops albiceps*, Siam, and *leucostictus*, Liberia, spp. nn., BOULENGER, Ann. Nat. Hist. (7) i, p. 124; *T. broomi*, sp. n., *id. op. cit.* ii, p. 414, Queensland; *T. philococos*, sp. n., WERNER, Zool. Anz. xxi, p. 553, Ralum, Bismarck Archipelago.

BOIDÆ.

J. ZENNECK, Zeitschr. wiss. Zool. lxiv, pp. 1-384, figg., pls. i-viii, publishes the results of his investigations on the markings of the *Boidæ*, and their derivation, as an application to a group of Snakes of the views of Eimer. His observations are to a great extent based on the material preserved in the British Museum.

Python sebae, L. On its habits in confinement: P. DE GRIJS, Zool. Garten, xxxix, p. 268; *P. molurus*, L. Notes on its habits in confinement: W. G. CLARKE, Zoologist, lvi, p. 436.

Trachyboa gularis, Ptrs. Note by BOULENGER, P. Z. S. 1898, p. 115.

Epicrates monensis, sp. n., ZENNECK, Zeitschr. wiss. Zool. lxiv, p. 64, Mona, W. I.

Lichanura trivirgata, Cope. On the colours of a living specimen: J. VAN DENBURGH, P. Amer. Philos. Soc. xxxvii, p. 141.

PALÆOPHIIDÆ.

Pterosphenus, g. n. for vertebræ apparently allied to *Palæophis*, Ow.; *P. schucherti*, sp. n. (foss.), F. A. LUCAS, P. U. S. Nat. Mus. xxi, p. 637 pl. xlv, Eocene of Cocoa, Alabama.

COLUBRIDÆ.

Aglypha.

Tropidonotus ordinatus, L. On its habits in confinement: P. DE GRIJS, Zool. Garten, xxxix, p. 203; *T. picturatus*, Schleg. Note by DOUGLAS OGILBY, P. Linn. Soc. N. S. Wales, xxiii, p. 359; *T. picturatus*, Schleg. Several species have been confounded under this name: BOULENGER, Ann. Mus. Genova (2) xviii, p. 703; *T. doriae*, sp. n., *id. ibid.* p. 704, New Guinea; *T. viperinus*, Latr. Notes on the habits: ROLLINAT, Bull. Soc. zool. France, xxiii, p. 59; *T. tessellatus*, Laur. Further notes on its distribution in Germany: GEISENHEYNER, Zool. Garten, xxxix, p. 3; *T. septemvittatus*, Say, is ovoviviparous: P. DE GRIJS, Zool. Garten, xxxix, p. 275.

Achalinus spinalis, Ptrs. Description of a specimen from the Province Kiushiu, Japan: NAMIYE, Ann. Zool. Japon. ii, p. 29, figg.

Synophis miops, sp. n., BOULENGER, P. Z. S. 1898, p. 115, pl. xii, fig. 1, Ecuador.

Pseudorhadinæa, g. n., allied to *Aspidura*, Wagl., for *P. melanogaster*, sp. n., BOETTGER, Katal. Rept. Mus. Senckenb. ii, p. 33, Nossi Bé, Madagascar.

Stegonotus modestus, Schleg. Note by MÉHELY, Termes. Fuzetek, xxi, p. 171; *S. reticulatus*, Blgr. = *S. modestus*, Schleg.: BOULENGER, Ann. Mus. Genova (2) xviii, p. 704.

Bascanium ornatum, B. & G. Note by BRUNER, P. Indiana Ac. 1897, p. 204.

Zamenis dahlui, Fitz. On its habits in confinement: P. DE GRIJS, Zool. Garten, xxxix, p. 267; *Z. biteniatus*, sp. n., BOETTGER, Katal. Rept. Mus. Senckenb. ii, p. 42, Guatemala.

Æluroglæna, g. n., somewhat related to *Zamenis*, Wagl., for *Æ. cucullata*, sp. n., BOULENGER, Ann. Nat. Hist. (7) ii, p. 132, Somaliland.

Spilotes megalolepis, Gthr., recorded from Ecuador by BOULENGER, P. Z. S. 1898, p. 115.

Coluber flavirufus, Cope. On the extraordinary contractibility of the pupil: P. DE GRIJS, Zool. Garten, xxxix, p. 270; *C. quatuorlineatus*,

- Lacép. On Dalmatian specimens : KOSIĆ, Glasnik Naravosl. druzt. x, p. 1 ; *C. quadrivirgatus*, Boie. On its habits in confinement : P. DE GRIJS, Zool. Garten, xxxix, p. 206 ; *C. tæniurus*, Cope. On the white Snake of the Selangor Caves : H. N. RIDLEY, J. Straits Asiat. Soc. 1898, p. 99 ; *C. subradiatus*, Schleg. Note by BOULENGER, Ann. Nat. Hist. (7) i, p. 123 ; *C. catenifer*, Blainv. On the time of laying in Central California : J. VAN DENBURGH, P. Amer. Phil. Soc. xxxvii, p. 139 ; *C. melanurus*, Schl. var. n. *timoriensis*, BETHENCOURT-FERREIRA, J. Sci. Lisb. (2) v, pp. 113 & 154, Timor ; *C. tauricus*, sp. n., WERNER, Zool. Anz. xxi, p. 217, Cilician Taurus.
- Leptophis bocourti*, sp. n., BOULENGER, P. Z. S. 1898, p. 116, Ecuador.
- Dendrelaphis schlenckeri*, sp. n., DOUGLAS OGILBY, P. Linn. Soc. N. S. Wales, xxiii, p. 361, fig., Brit. New Guinea.
- Liophis pæcilogyrus*, Wied. On its habits in confinement : P. DE GRIJS, Zool. Garten, xxxix, p. 209.
- Heterodon platyrhinus*, Latr. On its habits in confinement : P. DE GRIJS, t. c. p. 235.
- Rhadinæa kinkelini*, sp. n., BOETTGER, Katal. Rept. Mus. Senckenb. ii, p. 68, Nicaragua.
- Coronella getula*, L. On its habits in confinement : P. DE GRIJS, Zool. Garten, xxxix, p. 211 ; *C. calligaster*, Harl. Notes on the mode of feeding : HANAU, t. c. p. 49 ; *C. austriaca*, Laur. On its habits : P. SCHMIDT, t. c. p. 186.
- Grayia lubrica*, sp. n., W. L. SCLATER, Ann. S. African Mus. i, p. 109, pl. v, fig. 1, Cape Colony.
- Fleischmannia*, g. n., allied to *Trimetopon*, Cope, and *Hydromorphus*, Ptrs., for *F. obscura*, sp. n., BOETTGER, Katal. Rept. Mus. Senckenb. ii, p. 69, Costa Rica.
- Contia*, B. & G. On the West-Asian species : WERNER, Zool. Anz. xxi, p. 221.
- Atractus multicinctus*, Jan. Note by BOULENGER, P. Z. S. 1898, p. 116 ; *A. balzani*, sp. n., BOULENGER, Ann. Mus. Genova (2) xix, p. 129, Bolivia ; *A. lehmanni*, sp. n., BOETTGER, Katal. Rept. Mus. Senckenb. ii, p. 80, Ecuador.
- Geatractus*, g. n., for *Geophis tecpanicus*, Dugès. DUGÈS, P. Z. S. 1898, p. 539.
- Calamorhabdium*, g. n., allied to *Macrocalamus*, Gthr., for *C. kuekenthali*, sp. n., BOETTGER, Katal. Rept. Mus. Senckenb. ii, p. 82, Batjan Id.
- Calamaria semiannulata*, sp. n., BOETTGER, *op. cit.* p. 84, Borneo.
- Iguanognathus*, g. n. Teeth with spatulate crowns ribbed along the outer side. BOULENGER, Ann. Nat. Hist. (7) ii, p. 73 ; *I. werneri*, sp. n., *id. ibid.* p. 74, fig., Sumatra.
- Dasypeltis scabra*, L. Remarks on its mode of feeding : VAILLANT, C.R. Ac. Sci. cxxvii, p. 1229 ; L. KATHARINER, Zool. Jahrb. Anat. xi, pp. 501–518, pl. xli, and Zool. Garten, xxxix, p. 197, investigates the mouth, the digestive canal and the so-called ‘gular teeth’ of *Dasypeltis*. The latter he shows to be merely bony processes, without cement or enamel.

Opisthoglypha.

- F. WERNER, Zool. Garten, xxxix, pp. 85–90, remarks on the toxic properties of the bite of Opisthoglyphous Snakes.
- Tarbophis fallax*, Fleischm. On its habits in confinement : P. DE GRIJS, t. c. p. 210 ; *T. semiannulatus*, Smith, var. n. *meridionalis*, WERNER, Jahresber. Ver. Magdeburg, 1896–1898, p. 144, Cape Colony.
- Leptodira albofusca*, Lacép. On its habits in confinement : P. DE GRIJS,

- Zool. Garten, xxxix, p. 265. On a specimen of doubtful species : *id. ibid.* p. 280.
- Himantodes gracillimus*, Gthr. On its habits in confinement : P. DE GRIJS, *t. c.* p. 246.
- Dipsadomorphus irregularis*, Merr., var. n. *papuanus*, MÉHELY, Termes. Fuzetek, xxi, p. 172, German New Guinea.
- Oxyrhopus coronatus*, Schn. On its habits in confinement : P. DE GRIJS, Zool. Garten, xxxix, p. 274 ; *O. submarginatus*, Ptrs. Note by BOULENGER, Ann. Mus. Genova (2) xix, p. 130.
- Tachymenis peruvianus*, Wgm. On a living specimen : P. DE GRIJS, Zool. Garten, xxxix, p. 279.
- Philodryas arenarius*, sp. n., L. G. ANDERSSON, Ofv. Vet. Ak. Forh. 1898, p. 458, fig., Patagonia. [= *P. burmeisteri*, Jan.—REC.].
- Cælopeltis monspessulana*, Herm. On its habits in confinement : P. DE GRIJS, Zool. Garten, xxxix, p. 237.
- Psammophis sibilans*, L. On its habits in confinement : P. DE GRIJS, *t. c.* p. 241.
- Dryophis mycterizans*, L. Note on its habits in captivity : F. FINN, J. Asiat. Soc. Beng. (2) xlvii, p. 66.
- Dispholidus typus*, Smith. Note by BETHENCOURT-FERREIRA, J. Sci. Lisb. (2) v, p. 244.

Proteroglypha.

- SCHNEE, Zool. Garten, xxxix, pp. 90–96, remarks on the habits of the *Hydrophiinæ*.
- Distira macfarlani*, Blgr. Note by BOULENGER, Ann. Mus. Genova (2) xviii, p. 705.
- Hydrophis melanocephalus*, Gray. Description of a specimen from the Pescadores Ids. : STEJNEGER, J. Coll. Japan, xii, p. 224 ; *H. floweri*, sp. n., BOULENGER, P. Z. S. 1898, p. 106, pl. ix, Borneo.
- Aipysurus annulatus*, Krefft, redescribed and figured by BOULENGER, in Willey's Zool. Res. i, p. 57, pl. v. A young specimen of apparently the same species described as *Emydocephalus ijimæ*, sp. n., STEJNEGER, Journ. Sc. Coll. Tokyo, xii, p. 223, between Formosa and the Loo Choo Ids.
- Apistocalamus*, g. n., allied to *Ogmodon*, Ptrs., and *Toxicocalamus*, Blgr., for *A. loriae*, sp. n., BOULENGER, Ann. Mus. Genova (2) xviii, p. 705, pl. viii, fig. 1, Brit. New Guinea.
- Pseudelaps albiceps*, sp. n., BOULENGER, Ann. Nat. Hist. (7), ii, p. 414, N. Queensland.
- Diemenia maculiceps*, sp. n., BOETTGER, Katal. Rept. Mus. Senckenb. ii, p. 116, Queensland.
- Acanthophis pyrrhus*, sp. n., BOULENGER, Ann. Nat. Hist. (7) ii, p. 75, Central Australia.
- Elaps fulvius*, L. On its habits in confinement : P. DE GRIJS, Zool. Garten, xxxix, p. 276 ; *E. balzani*, sp. n., BOULENGER, Ann. Mus. Genova (2), xix, p. 130, Bolivia ; *E. rosenbergi*, sp. n., BOULENGER, P. Z. S. 1898, p. 117, pl. xiii, Ecuador.
- Neelaps caledonicus*, Trouessart, 1890, is a lapsus calami for *N. calonotus*, Gthr. TROUESSART, Bull. Soc. zool. France, xxiii, p. 186.

AMBLYCEPHALIDÆ.

- Leptognathus peruana*, sp. n., BOETTGER, Katal. Rept. Mus. Senckenb. ii, p. 128, Cuzco, Peru ; *L. ellipsifera*, sp. n., BOULENGER, P. Z. S. 1898, p. 117, pl. xii, fig. 2, Ecuador.

VIPERIDÆ.

W. LINDEMANN, Arch. mikr. Anat. liii, pp. 313-321, pl. xvi, makes a histological investigation of the poison-gland of *Vipera berus*.

Vipera berus, L. Remarks on the habits: M. v. KIMAKOWICZ, Verh. Siebenb. Ver. xlvii, p. 79. On its reluctance to take food in captivity: HANAU, Zool. Garten, xxxix, pp. 150 & 261; EIFFE, *t. c.* p. 222. On Portuguese specimens: BETHENCOURT-FERREIRA, J. Sci. Lisb. (2) v, p. 111; *V. aspis*, L. On its occurrence in the Dept. Orne, Normandy: LETACQ, Bull. Soc. Rouen, xxxiii, p. 76; *V. superciliaris*, Ptrs. Note by BETHENCOURT-FERREIRA, *t. c.* p. 112; *V. lebetina*, L., described and figured by STEINDACHNER, Denk. Ak. Wien, lxiv, p. 697, pl. i; *V. bornmülleri*, sp. n., WERNER, Zool. Anz. xxi, p. 218, Cilician Taurus. [= *V. lebetina*, L., var.—REC.]

Bitis heraldica, Bocage. Note by BETHENCOURT-FERREIRA, *t. c.* p. 245.

Crotalus oregonus, Holbr., = *C. lucifer*, B. & G.: J. VAN DENBURGH, P. Amer. Philos. Soc. xxxvii, p. 141.

DINOSAURIA.

O. C. MARSH, Amer. J. Sci. (4) vi, p. 487, diagnoses the families of Sauropoda: *Atlantosauridæ*, *Diplodocidæ*, *Morosauridæ*, *Pleurocælidæ*, *Cardiodontidæ*, *Titanosauridæ*.

H. F. OSBORN publishes restorations of the external characters of various types of American Dinosaurs. (Casts, Models, &c. of Fossil Vertebrates, New York, 1898.) His figures are reproduced in *Nature*, lviii, pp. 393 & 394, and in *Science* (2) vii, p. 841.

O. C. MARSH, Geol. Mag. (iv) v, pp. 6-9, remarks on various Dinosaurian remains preserved in European Museums.

Camarasaurus, Cope. On remains from the Como Bluffs of Wyoming: OSBORN, Bull. Amer. Mus. x. p. 219, figg.

Morosaurus grandis, Marsh. Sacrum described and figured by WILLISTON, Kansas Quart. vii, p. 173, figg.

Triceratops calicornis and *obtusus*, spp. nn., MARSH, Amer. J. Sci. (4) vi, p. 92, Cretaceous, Wyoming.

Avalonia, g. n., allied to *Megalosaurus*, for *A. sanfordi*, sp. n., SEELEY, Geol. Mag. (iv) v, p. 2, pl. i, figg. 1-5. Rhætic of Wedmore, Glastonbury.

Picrodon, g. n., near the preceding, for *P. herveyi*, sp. n., SEELEY, *t. c.* figg. 6-9, Rhætic of Wedmore.

EMYDOSAURIA.

General remarks on the organisation and classification: VAILLANT, Arch. Mus. Paris (3) x, pp. 143-169.

G. ABELSDORFF, Arch. Physiol. 1898, pp. 155-167, pl. iv, makes physiological observations on the eye of Crocodiles.

Alligator, Cuv. On the specimens in the Paris Museum: VAILLANT, *t. c.* p. 200; *A. sinensis*, Fauv. Skull figured, *id. ibid.* pl. xiii.

Caiman, Spix = *Jacaretinga*, Spix. On the specimens in the Paris Museum: VAILLANT, *t. c.* p. 170.

Heterodontosuchus, g. n., for a Crocodilian mandible characterized by the antero-posterior compression of the teeth, their closeness to one another, and by the great size of the two anterior teeth; *H. ganei*, sp. n. (foss.), F. A. LUCAS, Amer. J. Sci. vi, p. 399, Trias of S. Utah.

CHELONIA.

- O. P. HAY, Amer. Nat. xxxii, pp. 929–950, figg., writes on *Protostega*, and discusses the systematic position of *Dermochelys* and the morphogeny of the Chelonian carapace and plastron.
- L. VAILLANT, Bull. Mus. Paris, 1898, p. 261, fig., remarks on certain pathological malformations of the skeleton observed in Chelonians kept in the Menagerie of the Paris Museum.
- J. PALACKÝ, Bull. Ac. Prague, i, pp. 9–14, gives a résumé of his study of the geographical distribution of Chelonians.
- Trionyx cartilagineus*, Bodd., var. n. *newtoni*, BETHENCOURT-FERREIRA, J. Sci. Lisb. (2) v, pp. 114, 151, Timor; *T. rostratus*, sp. n. (foss.), G. v. ARTHABER, Beitr. Pal. Oesterr. Ung. xi, p. 179, pls. xxv–xxviii, Miocene, Au, Leitna Mts., Austria; *T. preschnensis*, sp. n. (foss.), G. L. LAUBE, Verh. geol. Reichsanst. 1898, p. 232, Miocene, Preschen, Bohemia.
- Emydura krefftii*, Gray, redescribed by MÉHELY, Termes. Fuzetek, xxi, p. 165.
- Hydromedusa tectifera*, Cope. On its habits in confinement: SCHNEE, Zool. Garten, xxxix, p. 346.
- Sternotherus oxyrhinus*, sp. n., BOULENGER, P. Z. S. 1897, p. 919, pl. liii, Hab. — ?
- Toxochelys latiremis*, Cope (foss.). On a fragment of a skull from Ft. Pierre, Kansas: G. WAGNER, Kansas Quart. vii, p. 201, fig.
- Cinosternum leucostomum*, A. Dum., recorded from Ecuador by BOULENGER, P. Z. S. 1898, p. 108.
- Testudo*. L. A. GÜNTHER, in his presidential address to the Linnean Society of London, P. Linn. Soc. cx, pp. 14–29, deals with recent progress of our knowledge of the distribution of the gigantic Land-Tortoises, and gives, as an Appendix, a list of publications on the subject from 1875 to 1898; *T. ephippium*, Gthr. On a specimen with abnormal pectoral shields: T. W. v. LIDTH DE JEUDE, Notes Leyd. Mus. p. 126, pls. iii–v; *T. commersonii*, sp. n., based on drawings of Commerson's: VAILLANT, Bull. Mus. Paris, 1898, p. 139, figg., Rodriguez (?).
- Xerobates undata*, Cope (foss.). Skull described and figured by J. Z. GILBERT, Kansas Quart. vii, p. 143, figg.
- Thalassochelys caretta*, L. On the rate of growth: ALBERT, PRINCE OF MONACO, C.R. Soc. Biol. (10) v, p. 10.
- Protostega ischyra*, Wieland (foss.). On the plastron: WIELAND, Amer. J. Sci. (4) v, p. 15, figg., pl. ii.
- Dermochelys coriacea*, L. Record and figure of a specimen from the Cape of Good Hope: DISTANT, Zoologist, lvi, p. 500, pl. v. On a specimen from the Adriatic: KOSIĆ, Glasnik Naravosl. druzt. x, p. 14, pl. i.

ICHTHYOSAURIA.

- L. MAGGI, Rend. Ist. Lombardo (2) xxx, pp. 1521–1524, figg., and xxxi, pp. 631–641, 761–771, pls. ii & iii, remarks on various points of homology in the cranium of *Ichthyosaurus* as compared to that of the Mammalia.
- F. BAUER, Palæontogr. xlv, pp. 283–328, pls. xxv–xxviii, deals with the Ichthyosaurs of the Upper White Jura, describing remains of *Ichthyosaurus posthumus*, Wagn., from Solnhofen.
- Ichthyosaurus*. On remains from the Lias of the Glaserbach near Salzburg: E. FUGGER, Mt. Geol. Landesk. Salzburg, xxxvii, 1897, p. 19.

PLESIOSAURIA.

- Polyptychodon interruptus*, Ow. On a fragment of skull; F. BAYER, SB. Bohmisch. Ges. 1897, i, No. xxvii.
Megalneusaurus, g. n., allied to *Pliosaurus*, for *Cimoliosaurus rex*, Knight: W. C. KNIGHT, Amer. J. Sci. (4) v, p. 378, figg.

RHYNCHOCEPHALIA.

- A. DENDY, P. R. Soc. London, lxiii, pp. 440-443, summarises his observations on the development of *Sphenodon punctatus*.
 A propos of the hibernation of the *Sphenodon*-embryo, the RECORDER points out the parallel known case of *Emys orbicularis*, Nature, lviii, p. 619.
 SCHAUINSLAND, Sitzb. Ak. Berl. 1898, pp. 629-631, 701-704, has preliminary notes on the habits and development of *Sphenodon punctatus*.
 O. OSAWA, Arch. mikr. Anat. li, pp. 481-691, figg., 764-794, pls. xxiii-xxv, describes the anatomy of *Sphenodon punctatus*.
 O. OSAWA, Verh. Anat. Ges. xii, p. 100, regards *Sphenodon* as an Agamoid Lacertilian. Protest by H. GADOW, Anat. Anz. xx, pp. 41-43.
 E. KALLIUS, Anat. Anz. xiv, pp. 623 & 624, fig., remarks on the presence of a fovea centralis in the retina of *Sphenodon punctatus*, contrary to the statement of OSAWA. Reply by OSAWA, *op. cit.* xv, pp. 226 & 227, fig.
Proterosaurus speneri, H. v. Mey. (foss.). On a specimen in the Magdeburg Museum: CREDNER, Jahresber. Ver. Magdeburg, 1896-98, p. 121. On the presence of intercentra between the dorsal vertebræ, and on other points of interest in the skeleton: F. ETZOLD, N. Jahrb. Min. 1898, ii, p. 147, fig.

ANOMODONTIA.

- H. G. SEELEY, Ann. Nat. Hist. (7) i, p. 164, remarks on the cranial characters of some Dicynodonts.
Rhabdotocephalus, subg. n. of *Ptychognathus*, Ow., for *R. maccaigi*, Seeley. SEELEY, *t. c.* p. 165.
Mochlorhinus, subg. n. of *Ptychognathus*, Ow., for *M. platyceps*, sp. n., *id. ibid.* figg., Trias, Bethulie, Orange Free State.
Aulacocephalus and *Rhachiocephalus*, nn. subgg. of *Oudenodon*, Bain: SEELEY, Geol. Mag. (IV) v, p. 107; *O. (Aulacocephalus) pithecopis*, sp. n., *id. ibid.* fig., Trias of East London, Cape Colony.
Aulacocephalodon and *Rhachicephalodon*, nn. subgg. of *Dicynodon*, Ow. SEELEY, *t. c.*

BATRACHIA.

- The RECORDER has prepared a fourth Report on additions to the Batrachian collection in the British Museum (Natural History). The additions from 1894 to 1898 number 115 *Ecaudata*, 10 *Caudata*, 4 *Apoda*. P. Z. S. 1898, pp. 473-482.
 G. M. WINSLOW investigates the Chondrocranium of Batrachians: Bull. Essex Inst. xxviii, pp. 87-121, and Stud. Biol. Tufts Coll. No. 5, pp. 147-200, 4 pls.
 E. GÖPPERT, Verh. Deutsch. zool. Ges. 1898, pp. 165-171, figg., remarks on the morphology of vertebræ and ribs.

- H. L. BRUNER, P. Indiana Ac. 1897, p. 203, describes some facial muscles.
 ESTHER F. BYRNES, J. Morphol. xiv, pp. 105-140, pls. x-xii, writes on the development of limb-muscles.
 F. KOPSCH, Verh. Anat. Ges. xii, pp. 76-80, figg., has remarks on gastrulation and early development in *Rana* and *Amblystoma*.
 K. ACKERMANN summarises our knowledge of hybridisation in Batrachians. Ber. Ver. Kassel, lxii, pp. 11-15.

ECAUDATA.

- C. EMERY, Anat. Anz. xiv, pp. 381 & 382, replies to some criticisms of A. Perrin's of his work on the carpus of the tailless Batrachians.
 H. SPEMANN, Zool. Jahrb. Anat. xi, pp. 389-416, figg., pls. xxviii-xxx, investigates the early development of the skull and the Eustachian tubes in the common Frog.
 W. G. RIDEWOOD, J. Linn. Soc. xxvi, pp. 474-487, pl. xxxi, investigates the larval hyobranchial skeleton of the tailless Batrachians, and, P. Z. S. 1898, pp. 4-12, pl. ii, describes the development of the hyobranchial skeleton in *Alytes obstetricans*.
 MÄRTENS, Verh. Anat. Ges. xii, pp. 238-240, remarks on the development of the laryngeal cartilages in European tailless Batrachians.
 M. NUSSBAUM, Arch. mikr. Anat. li, pp. 213 & 214, remarks on differences in the soft anatomy between the German species of *Rana*. Reply by FRANKL, t. c. p. 857.
 H. BEISSNER, *op. cit.* liii, pp. 168-179, figg., pl. ix, compares the structure of the sperm-ducts in *Rana temporaria* and *R. esculenta*.
 G. VALENTI, Atti Soc. Tosc. Mem. xvi, pp. 59-71, pl. iii, investigates the relation of the anterior extremity of the notochord with the intestine in larvæ of tailless Batrachians.
 F. BRAEM, Zeitschr. wiss. Zool. lxiii, pp. 433-439, pl. xxii, writes on the cerebral epiphysis and hypophysis in *Rana*.
 F. MAURER, Morphol. Jahrb. xxvi, pp. 330-336, figg., writes on the vascularisation of the epidermis in tailless Batrachians at the period of metamorphosis.
 O. WEISS, Arch. mikr. Anat. liii, pp. 385-396, figg., writes on the cutaneous glands of *Bufo*.
 ESTHER F. BYRNES, Anat. Anz. xv, pp. 104-107, figg., has obtained the regeneration of limbs in frog-embryos after the extirpation of limb-rudiments.
 W. G. RIDEWOOD investigates the skeleton of regenerated hind limbs in *Alytes obstetricans*. P. Z. S. 1898, pp. 101-106, figg.
 A. SCHAPER, Arch. Entwicklmech. vi, pp. 151-197, figg., pls. vii-xii, publishes results of experiments on the development of artificially mutilated frog-larvæ.
 R. G. HARRISON, *op. cit.* vii, pp. 430-485, figg., pls. x & xi, makes experiments on the growth and regeneration of the tail of frog-larvæ, with and without grafting.
 D. BARFURTH, Verh. Anat. Ges. xii, pp. 24-26, remarks on the experimental production of bifid tails in frog-larvæ.
 G. TORNIER, Zool. Anz. xxi, pp. 372-379, figg., describes a case of polymely in *Rana esculenta*.
 H. ADOLPHI, SB. Ges. Dorpat. xi, pp. 215 & 216, remarks on a malformed vertebral column of *Bufo vulgaris*.
 M. JAQUET, Bull. Soc. Bucarest, vii, p. 499, figg., investigates the anatomy of the hind limb of a *Rana esculenta*, anomalous as a result of injury.
 G. P. MUDGE, J. Anat. Physiol. norm. path. (2) xii, pp. 54-63, describes an interesting case of connection between the lungs and systemic

circulatory organs and of an abnormal hepatic blood supply in a *Rana temporaria*.

- E. WARREN, *Anat. Anz.* xiv, p. 551, fig. 1, notices an abnormality in the vascular system of a *Rana temporaria*.
 O. HERTWIG, *Arch. mikr. Anat.* li, pp. 319–381, pl. xv, writes on the influence of temperature on the development of *Rana temporaria* and *R. esculenta*.
 S. JOURDAIN, *C.R. Ac. Sci.* cxxvii, pp. 531 & 532, remarks on air and water as factors in the alimentation of Batrachian embryos.
 F. WERNER, *Verh. Ges. Wien*, xlviii, pp. 11–14, remarks on the nursing habits of tailless Batrachians.
 J. PALACKÝ, *Verh. Ges. Wien*, xlviii, pp. 374–382, remarks on the geographical distribution of the tailless Batrachians.

PHANEROGLOSSA.

RANIDÆ.

- Rana temporaria*, L. Notes on the habits by FISCHER-SIGWART, *Vierteljahrschr. Ges. Zurich*, xlii, p. 238, pl.; *R. macroscelis*, Blgr. Note by BOULENGER, *Ann. Mus. Genova* (2) xviii, p. 706; *R. mascareniensis*, D. & B., note by BETHENCOURT-FERREIRA, *J. Sci. Lisb.* (2) v, p. 240; var. n. *æquiplicata*: WERNER, *Verh. Ges. Wien*, xlviii, p. 192, Cameroon; *R. holtzi*, sp. n., WERNER, *Zool. Anz.* xxi, p. 222, Cilician Taurus [= *R. camerani*, Blgr.—REC.]; *R. longicrus*, sp. n., STEJNEGER, *J. Coll. Japan*, xii, p. 216, Formosa.
Phrynobatrachus perpalmatus, sp. n., BOULENGER, *P. Z. S.* 1898, p. 479, pl. xxxviii, fig. 1, Lake Mwero, C. Africa.
Arthroleptis sechellensis, Bttgr. On the nursing habits: A. BRAUER, *Zool. Jahrb. Syst.* xi, p. 89, figg.; *A. variabilis*, Matsch. Note on colour-varieties: WERNER, *Verh. Ges. Wien*, xlviii, p. 193; *A. verrucosus*, sp. n., *id. ibid.* p. 194, pl. ii, fig. 8, Cameroon; *A. moorii*, sp. n., BOULENGER, *t. c.* p. 479, pl. xxxviii, fig. 2, Lake Tanganyika.
Cornufer johnstoni, Blgr., redescribed and figured by WERNER, *Verh. Ges. Wien*, xlviii, p. 200, pl. ii, figg. 2 & 3.
Astylosternus, g. n., differing from *Cornufer* in the absence of a bony style to the sternum, for *A. diadematus*, sp. n., WERNER, *t. c.* p. 200, fig. 1, Cameroon.
Chiromantis rufescens, Gthr. Note by WERNER, *Verh. Ges. Wien*, xlviii, p. 193.
Heleophryne, g. n., differing from *Rhacophorus* in the vertical pupil and free fingers: W. L. SCLATER, *Ann. S. African Mus.* i, p. 110; *H. purcelli*, sp. n., *id. ibid.* p. 111, pl. v, fig. 3, Cape Colony.
Rappia viridiflava, D. & B. Note by BOULENGER, *Ann. Mus. Genova* (2) xviii, p. 721; *R. plicifera*, Bocage. Note by BETHENCOURT-FERREIRA, *J. Sci. Lisb.* (2) v, p. 241.
Megalixalus fornasinii, Bianc., and *spinosus*, Buchh. & Ptrs. Notes by WERNER, *Verh. Ges. Wien*, xlviii, pp. 195 & 196; *M. gramineus*, sp. n., BOULENGER, *t. c.* p. 721, pl. x, fig. 2, Brit. E. Africa.
Hylambates rufus, Reich. Note by WERNER, *Verh. Ges. Wien*, xlviii, p. 196; vars. nn. *boulengeri*, *modesta*, *ventrimaculata*, *id. ibid.* pp. 197 & 198, Cameroon; *H. brevirostris*, sp. n., *id. ibid.* p. 199, pl. ii, figg. 5 & 6, Cameroon; *H. vannutellii*, sp. n., BOULENGER, *t. c.* p. 722, pl. x, fig. 3, Brit. E. Africa.
Cassina senegalensis, D. & B., var. n. *intermedia*: WERNER, *Jahresber. Ver. Magdeburg*, 1896–1898, p. 148, Cape Colony [= ? *C. wealii*, Blgr.—REC.].
Phyllobates infraguttatus, sp. n., BOULENGER, *P. Z. S.* 1898, p. 118, pl. xiv, fig. 1, Ecuador.

ENGYSTOMATIDÆ.

- Atelopus elegans*, Blgr. Note by BOULENGER, P. Z. S. 1898, p. 119.
Phrynixalus oxyrhinus, sp. n., BOULENGER, P. Z. S. 1898, p. 480, pl. xxxviii, fig. 3, St Aignan Island, Brit. New Guinea.
Mantophryne robusta, sp. n., BOULENGER, *t. c.* p. 480, pl. xxxviii, fig. 4, St Aignan Island.
Sphenophryne cornuta, Ptrs. & Dor. Note by BOULENGER, Ann. Mus. Genova (2) xviii, p. 707; *S. verrucosa*, p. 707, pl. viii, fig. 2, *loriæ*, p. 707, pl. viii, fig. 3, and *ateles*, p. 708, pl. viii, fig. 4, spp. nn., *id. ibid.*, Brit. New Guinea.
Choanacantha, g. n., allied to *Xenobatrachus*, Ptrs. & Dor., for *C. rostrata*, sp. n., MÉHELY, Termes. Fuzetek, xxi, p. 175, pl. xii, German New Guinea; *C. mehelyi*, sp. n., BOULENGER, Ann. Mus. Genova (2) xviii, p. 709, pl. viii, fig. 5, Brit. New Guinea.

CYSTIGNATHIDÆ.

- Hylodes anomalus*, p. 119, pl. xiv, fig. 2, *longirostris*, p. 120, pl. xv, fig. 1, *achatinus*, p. 120, pl. xv, fig. 2, *gularis*, p. 121, pl. xv, fig. 3, and *latidiscus*, p. 121, pl. xv, fig. 4, spp. nn., BOULENGER, P. Z. S. 1898, Ecuador; *H. alfredi*, sp. n., *id. ibid.* p. 480, pl. xxxix, fig. 1, Vera Cruz, Mexico.
Syrrhopus areolatus, sp. n., BOULENGER, *t. c.* p. 122, pl. xiv, fig. 3, Ecuador.
Leptodactylus pulcher, sp. n., BOULENGER, *t. c.* p. 122, pl. xiv, fig. 4, Ecuador; *L. bolivianus*, sp. n., BOULENGER, Ann. Mus. Genova (2) xix, p. 131, Bolivia.
Borborocoetes mexicanus, sp. n., BOULENGER, P. Z. S. 1898, p. 481, pl. xxxix, fig. 2, Zacatecas, Mexico.

BUFONIDÆ.

- Nectophryne parvipalmata*, sp. n., WERNER, Verh. zool.-bot. Ges. Wien, xlviii, p. 201, pl. ii, fig. 7, Cameroon?
Bufo lentiginosus, Shaw. On its habits: GAGE, P. Amer. Ass. xlvii, p. 374; *B. boreas*, Gir.; recorded from Alaska by J. VAN DENBURGH, P. Amer. Philos. Soc. xxxvii, p. 139; *B. coniferus*, Cope, redescribed by BOULENGER, P. Z. S. 1898, p. 123; *B. preussi*, Matsch., redescribed as *Atelopus africanus*, sp. n., WERNER, Verh. Ges. Wien, xlviii, p. 201, fig.; *B. lævissimus*, Wern. Note and figure, *id. ibid.* p. 202, pl. ii, fig. 1.

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- Hyla regilla*, B. & G. On its variations: F. C. TEST, P. U. S. Mus. xxi, p. 477, pl. xxxix; *H. pickeringii*, Holbr., recorded from Ohio by VICKERS, Rep. Ohio Labor. vi. p. 28; *H. impura*, Ptrs. & Dor., redescribed by MÉHELY, Termes. Fuzetek, xxi, p. 176; *H. dolichopsis*, Cope, var. n. *pollicaris*, WERNER, Zool. Anz. xxi, p. 554, Bismarck Archipelago; *H. rosenbergi*, sp. n., BOULENGER, P. Z. S. 1898, p. 123, pl. xvi, Ecuador; *H. microcephala*, sp. n. [this name being preoccupied should be changed to *H. underwoodi*.—REC.], *id. ibid.* p. 481, pl. xxxix, fig. 3, Costa Rica; *H. fallax*, sp. n., *id. ibid.* p. 482, pl. xxxix, fig. 4, New Guinea; *H. balzani*, sp. n., BOULENGER, Ann. Mus. Genova (2) xix, p. 132, Bolivia.
Nototrema angustifrons and *cornutum*, spp. nn., BOULENGER, P. Z. S. 1898, p. 124, pl. xvii, fig. 1 & pl. xviii, Ecuador.

- Hylella parambae*, sp. n., BOULENGER, *t. c.* p. 125, pl. xvii, fig. 2, Ecuador;
H. brachypus, sp. n., WERNER, Zool. Anz. xxi, p. 554, Ralum, Bismarck
 Archipelago.

AGLOSSA.

- W. WINSLOW, Tufts Coll. Stud. No. 5, pp. 170–172, pl. iii, figg. 20 & 21,
 describes and figures the chondrocranium of *Pipa americana*.
Xenopus clivii, sp. n., PERACCA, Boll. Mus. Torino, xiii, No. 321, Erythræa.

CAUDATA.

- W. WINSLOW, Tufts Coll. Stud. No. 5, pp. 150–170, pls. i–iii, describes and
 figures the chondrocranium of various tailed Batrachians.
 H. ADOLPHI, Morphol. Jahrb. xxv, pp. 544–554, figg., has observations
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 vulgaris*.
 F. C. WAITE, Bull. Mus. Harvard, xxxi, 1897, pp. 71–92, 2 pls., writes on
 variations in the brachial and lumbo-sacral plexi of *Necturus
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 A. VAN GEUCHTEN, Arch. Biol. xv, pp. 599–619, pls. xxix & xxx, investi-
 gates the structure of the spinal cord of *Salamandra maculosa*.
 E. GIACOMINI, Monit. Zool. ital. ix, pp. 92–95, 105–110, writes on nerve-
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 fibres of the limbs in tailed Batrachians.
 E. BETHGE, Zeitschr. wiss. Zool. lxiii, pp. 680–707, pls. xlii & xliii, investi-
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 the development of the heart and blood-vessels in *Molge alpestris*.
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 have a second memoir on the genesis of the egg in tailed Batrachians,
 dealing with the Axolotl and the Newts.
 H. GRÖNROOS, Anat. Anz. xiv, pp. 456–463, figg., and Verh. Anat. Ges. xii,
 pp. 261–263, has made observations on gastrulation in *Salamandra
 maculosa*.
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 cristata*.
 J. PALACKÝ, Sitzungsber. Bohm. Ges. 1898, No. xxxv, remarks on the
 geographical distribution of the *Salamandridæ*.
Molge. On a hybrid male newt, the result of the crossing of a hybrid *M.
 cristata* × *M. marmorata* with the former species : BOULENGER, P. Z. S.
 1898, p. 127 ; *M. italica*, sp. n., PERACCA, Boll. Mus. Torino, xiii, No.
 317, and P. Z. S. 1898, p. 482, pl. xl, S. Italy.
Tylototriton verrucosus, And., figured by WOLTERSTORFF, Feuille Natural.
 xxvii, pl.
Plethodon oregonensis, Gir. On the breeding habits : J. VAN DENBURGH,
 P. Amer. Phil. Soc. xxxvii, p. 140.

- Megalobatrachus maximus*, Sieb. On specimens believed to be from Amoy and Canton : P. KREFFT, Verh. Ges. Deutsch. Naturf. lxi, p. 187.
- Amphiuma means*, L. On its occurrence in Virginia : H. M. SMITH, P. U. S. Mus. xxi, p. 379.

APODA.

- W. WINSLOW, Tufts Coll. Stud. No. 5, pp. 175-182, pls. iii & iv, describes and figures the chondrocranium of *Ichthyophis glutinosus*, with remarks on the affinities of apodal Batrachians.
- K. PETER, Morphol. Jahrb. xxv, pp. 554-628, fig., pls. xix-xxi, investigates the structure and development of the skull of *Ichthyophis glutinosus*.
- A. BRAUER, Zool. Jahrb. Anat. xii, pp. 477-508, pls. xxii-xxv, concludes his account of the development of *Hypogeophis*, Peters.

STEGOCEPHALA.

- L. MAGGI, Rend. Ist. Lombardo (2) xxxi, pp. 211-228, pl. i, has remarks on the interparietal plates and on their supposed homology with the interparietal ossifications in Man.

V. PISCES.

BY

G. A. BOULENGER, F.R.S.

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I. TITLES.*

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- *ALESSI, C. Sviluppo della colonna vertebrale nei Clupeidi. Tesi, Catania, 1898, 8vo, 13 pp.
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II. GENERAL SUBJECT.

T. GILL, Rep. Brit. Ass. 1897, p. 696, remarks on the division of the Fishes into several Classes.

Pp. 1-122 of A. S. WOODWARD'S 'Outlines of Vertebrate Palæontology' are devoted to the Fishes.

E. C. CASE, J. Geol. vi, pp. 393-416, figg., has an elementary article on the development and geological relations of fossil Fishes.

G. M. WINSLOW, Stud. Biol. Lab. Tufts Coll. No. 5, pp. 147-200, 4 pls., and Bull. Essex Inst. xxviii, pp. 122-133, writes on the Chondrocranium.

O. THILO, *Morphol. Jahrb.* xxvi, pp. 81–90, has a supplement to his contribution on the transformations of the limbs in Fishes.

W. SALENSKY, *Annuaire Mus. St Petersburg*. 1898, pp. 215–275, pls. ii–v, writes on the development of the ichthyopterygium in Ganoids and Dipnoans.

H. C. REDEKE publishes a Dissertation (Helder, 8vo, 87 pp., 2 pls.) on the urogenital system of Selachians and Holocephalians.

E. YUNG, *Arch. Sci. Nat.* (4) vi, pp. 509–511, has remarks on the structure and functions of the intestine of Fishes.

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D. BERTELLI, *Atti Soc. Tosc. Mem.* xvi, pp. 73–77, has further remarks on the primitive kidneys and the dorsal diaphragm.

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E. GIGLIO-TOS, *Mem. Acc. Torin.* (2) xlviii, pp. 143–208, 2 pls., has a memoir on the blood-corpuscles.—French résumé, *Arch. ital. Biol.* xxix, pp. 287–293.

F. K. STUDNIČKA, *Anat. Anz.* xiv, pp. 561–569, has further remarks on the fore-brain of Fishes.

B. HALLER, *Morphol. Jahrb.* xxvi, pp. 345–641, figg., pls. xii–xxii, has a memoir on the structure of the brain in *Salmo* and *Scyllium*.

CATOIS, *C.R. Ac. Sci.* cxxvi, pp. 433–435, writes on the neurology of the encephalon of Fishes.

F. J. COLE, *Tr. Linn. Soc. London* (2) vii, pp. 115–221, pls. xxi–xxiii, and *Tr. Liverp. Biol. Soc.* xii, pp. 228–247, has observations on the structure and morphology of the cranial nerves and lateral sense organs of Fishes, with special reference to the genus *Gadus*.

W. SZEZAWINSKA, *Arch. Biol.* xv, pp. 463–509, pls. xxi & xxii, investigates the nervous system of Fishes, especially Selachians.

E. HOLMGREN, *Anat. Anz.* xv, pp. 117–125, figg., has a preliminary communication on the spinal ganglia of Selachians and Teleosteans.

K. ACKERMANN has compiled a list of known cases of hybridism in Fishes. *Ber. Ver. Kassel*, lxii, pp. 4–11.

FABRE-DOMERGUE & BIETRIX, *C.R. Soc. Biol.* (10) v, pp. 466–468, insist on the insufficiency of the nutrition derived from the vitelline vesicle alone in the larvæ of marine Fishes.

A. DISSARD, *Naturaliste*, xx, pp. 186–189, records some experiments on asphyxy in marine and freshwater Fishes.

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A. S. WOODWARD, *Nat. Sci.* xii, pp. 257–260, remarks on the antiquity of the deep-sea Fish-fauna.

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T. W. VAN LIDTH DE JEUDE gives a list of the osteological specimens of Fishes preserved in the Leyden Museum. (*Catal. ostéol. Mus. Pays-Bas*, x², part ii.)

III. FAUNÆ.

NORTH ATLANTIC.

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England. On the Fishes of the River Hull: H. M. FOSTER, Tr. Hull Club, i, pp. 10-21.

France. H. GADEAU DE KERVILLE, Bull. Soc. Rouen, xxxiii, pp. 385-387, gives a list of fishes obtained by him on the coast of Normandy, at Grandcamp-les-bains and the St Marcouf Islands. J. M. F. RÉGUIER, Mem. Ac. Vaucluse, xvii, pp. 23-66, figg., continues his ichthyological fauna of the Dept. Vaucluse, and the first part of a similar work on that of the Dept. Yonne, by the late E. MOREAU appears in Bull. Soc. Yonne, li, pp. 143-227.

Germany. On the freshwater Fishes: H. NITSCHKE, Z. f. Fischerei, vi, pp. 65-138, figg. O. SCHNEIDER, Abh. Ver. Bremen, xvi, pp. 39 & 40, enumerates the freshwater fishes known from the North Sea Island Borkum.

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Croatia. N. B. KOSIC, Glasnik Naravosl. Drust. x, pp. 77-88, makes additions to the marine Fish-fauna of Croatia.

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ACANTHOPTERYGII.

CENTRARCHIDÆ.

- Kuhlia rupestris hedleyi*, subsp. n., DOUGLAS-OGILBY, P. Linn. Soc. N. S. Wales, xxii, p. 767, New Caledonia; *K. sternecki*, sp. n., STEINDACHNER, SB. Ak. Wien, cvii, i, p. 461, pl., Gulf of Akabah.

PERCIDÆ.

- Percina caprodes*, Raf. On variations: MOENKHAUS, P. Ind. Ac. 1897, p. 207.
- Etheostoma sciotense*, sp. n., OSBURN & WILLIAMSON, Rep. Ohio Labor. vi, p. 17, Franklin Co., Ohio.
- Cottogaster cheneyi*, sp. n., EVERMANN & KENDALL, Bull. U. S. Fish Comm. xvii, p. 129, pl. viii, fig. 8, State of New York.
- Boleosoma nigrum*, Raf. On variations: MOENKHAUS, P. Ind. Ac. 1897, p. 207.
- Ulocentra meadia*, sp. n., JORDAN & EVERMANN, Fish. N. Am. iii, p. 2852, East Tennessee.

SERRANIDÆ.

- Labrax lijiuy*, Basil., = *Lateolabrax japonicus*, Schleg. GÜNTHER, Ann. Nat. Hist. (7) i, p. 258.
- Stereolepis gigas*, Ayres. Described and figured by BOULENGER, P. Z. S. 1897, p. 917, pl. lii, with remarks on the Japanese *Megaperca ischinagi*, Hilgend.
- Epinephelus chrysotenia*, Doderl. = *E. alexandrinus*, C. & V., STEINDACHNER, SB. Ak. Wien, cvii, 1, p. 787; *E. townsendi*, sp. n., BOULENGER, Ann. Nat. Hist. (7) ii, p. 133, Sind.
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- Dermatolepis zancus*, sp. n., EVERMANN & KENDALL, Bull. U. S. Fish Comm. xvii, p. 129, pl. viii, fig. 9, Florida.
- Anthias lepidopterus*, Blkr., figured by WAITE, Rep. Fish. 'Thetis,' pl. i.
- Callanthias platei*, sp. n., STEINDACHNER, Zool. Jahrb., Suppl. iv, p. 284, pl. xv, Juan Fernandez. The same species, apparently, figured by WAITE, op. cit. pl. ii, as *C. allporti*, Gthr.
- Lates microlepis*, sp. n., BOULENGER, Tr. Z. S. xv, p. 6, pl. i, fig. 1, Lake Tanganyika.

Pseudolates, g. n., for *Lates heberti*, Gerv. (foss.), which is redescribed and figured: PRIEM, Bull. Soc. geol. France (3) xxvi, p. 405, pl. x, figg. 7, 8 & xi, fig. 1.

Neomœnis griseus, L. Colours described from life by EVERMANN & B. A. BEAN, *t. c.* p. 244; *N. hastingsi*, sp. n., T. H. BEAN, Bull. Amer. Mus. x, p. 45, Bermudas.

Brephostoma carpenteri, Alc., figured by ALCOCK, Ill. Zool. Investig. pl. xviii, fig. 2.

PRISTIPOMATIDÆ.

Pomadasis bayanus, n. n. for *Pristipoma humile*, Kner & Stdr. nec Bowdich: JORDAN & EVERMANN, Fish. N. Am. ii, p. 1331.

Anisotremus surinamensis, Bl., described by EVERMANN & B. A. BEAN, Rep. U. S. Fish Comm. f. 1896, p. 244.

Diagramma mediterraneum, Guich., recorded from the coast of Portugal by L. VIEIRA, Ann. Sci. Nat. Porto, v, p. 119; *D. goeldii*, Blgr., figured by GOELDI, Bol. Mus. Para. ii, pl., fig. 1.

Anisotrema surinamensis, Bl. Florida specimen described and figured by EVERMANN & KENDALL, Bull. U. S. Fish Comm. xvii, p. 130, pl. viii, fig. 10.

Lobotes pacificus, sp. n., JORDAN & EVERMANN, Fish. N. Am. iii, p. 2857, Pacific Coast of C. America.

Mœna vulgaris, Cuv. Note by SICHER, Atti Acc. Gioen. (4) xi, No. 5, p. 61.

Histiopaterus elevatus, Rams. & D. Ogilb., figured by WAITE, Rep. Fish. 'Thetis,' pl. iii; *H. farnelli*, sp. n., *id. ibid.* p. 25, pl. iv, New South Wales.

GERRIDÆ.

Gerres embryx, sp. n., JORDAN & EVERMANN, Fish. N. Am. ii, p. 1379, Charleston, S. Carolina.

SQUAMIPINNES.

Chaetodon bricei, sp. n., H. H. SMITH, Bull. U. S. Fish Comm. xvii, p. 102, fig., Coast of Massachusetts; *C. hoeferi*, Kramb. (foss.), described and figured by GORJANOVIĆ-KRAMBERGER, Glasnik Naravosl. Drust. x, p. 30, pl. ii, fig. 2, & pl. iii.

Forcipiger, g. n., allied to *Chelmon*, Cuv., for *F. flavissimus*, sp. n., JORDAN & EVERMANN, Fish. N. Am. ii, p. 1671, Rocky islands off W. Coast of Mexico.

Angelichthys isabelita, sp. n., JORDAN & EVERMANN, *t. c.* p. 1685, Florida Keys.

SPARIDÆ.

Sparus centrodontus, Delaroche. On a case of malformation of the mouth: GARSTANG, J. Mar. Biol. Ass. (2) v, p. 345.

Girella albotriata, sp. n., STEINDACHNER, Zool. Jahrb., Suppl. iv, p. 287, pl. xvi, Juan Fernandez.

CIRRHITIDÆ.

Chilodactylus bicornis, sp. n., STEINDACHNER, Zool. Jahrb., Suppl. iv, p. 291, pl. xvii, Juan Fernandez.

SCORPÆNIDÆ.

- Sebastes norvegicus*, Ascan. On larval specimens: HOLT, P. Z. S. 1898, p. 550; *S. muciparus*, Alc., figured by ALCOCK, Ill. Zool. Investig. pl. xviii, fig. 5.
- Sebastolobus alascanus*, Bean. On the osteological characters: STARKS, P. Calif. Ac. (3) i, p. 361, pls. xxii-xxiv.
- Sebastodes aleutianus*, p. 1795, Aleutian Ids., *atrorubens*, p. 1796, Coast of California, and *mitzukurii*, p. 1831, Japan, spp. nn., JORDAN & EVERMANN, Fish. N. Am. ii; *S. chilensis*, sp. n., STEINDACHNER, Zool. Jahrb., Suppl. iv, p. 295, Chili.
- Emmelas*, subg. n. of *Sebastodes*, Gill, for *S. glaucus*, Hilgend.: JORDAN & EVERMANN, Fish. N. Am. ii, p. 1773.
- Scorpena erostris*, Alc., and *bucephalus*, Alc., figured by ALCOCK, *op. cit.* figg. 6 & 7; *S. rubellio* and *teneriffæ*, spp. nn., JORDAN & GUNN, P. Ac. Philad. 1898, pp. 344 & 345, Canary Ids.; *S. voelzkowi*, sp. n., JATZOW & LENZ, Abh. Senck. Ges. xxi, p. 503, pl. xxxiv, fig. 1, Zanzibar.
- Pterois macrura*, Alc., figured by ALCOCK, Ill. Zool. Investig. pl. xviii, fig. 4.
- Micropus longipinnis*, sp. n., JATZOW & LENZ, Abh. Senck. Ges. xxi, p. 505, pl. xxxiv, fig. 2, Zanzibar.

BERYCIDÆ.

- Flammeo*, g. n., for *Holocentrum marianum*, C. & V.: JORDAN & EVERMANN, Fish. N. Am. iii, p. 2871.
- Trachichthys fernandezianus*, Gthr., described and figured by STEINDACHNER, Zool. Jahrb., Suppl. iv, p. 297, pl. xviii; *T. elongatus*, Gthr., figured by WAITE, Rep. Fish. 'Thetis,' pl. v.
- Caulolepis longidens*, Gill, recorded from the coast of Southern California by GILBERT, P. U. S. Mus. xxi, p. 565. On a second example from the Atlantic: B. A. BEAN, *t. c.* p. 639.
- Beryx polymicrodus*, sp. n. (foss.): A. STEWART, Kansas Quart. vii, p. 195, Kansas Cretaceous.
- Pagellus libanicus*, Pict. (foss.). Note on the type specimen: A. S. WOODWARD, Ann. Nat. Hist. (7) ii, p. 488.
- Pycnosterinx dorsalis*, Pict. (foss.) Note on the type specimen: A. S. WOODWARD, *t. c.* p. 489.

SCIÆNIDÆ.

- Nebris microps*, C. & V., redescribed by VAILLANT, Notes Leyd. Mus. xx, p. 17; *N. zestus*, sp. n., JORDAN & EVERMANN, Fish. N. Am. ii, p. 1417, Panama.
- Umbrina valida*, sp. n., JORDAN & GUNN, P. Ac. Philad. 1898, p. 342, Canary Ids.
- Sciæna tenlo*, Basil, and *crocea*, Richards., redescribed by GÜNTHER, Ann. Nat. Hist. (7) i, p. 259.
- Larimus effulgens*, sp. n. (GILBERT), JORDAN & EVERMANN, Fish. N. Am. ii, p. 1421, Panama.
- Odontoscion xanthops*, sp. n. (GILBERT), JORDAN & EVERMANN, *t. c.* p. 1426, Panama.
- Nector*, subg. n. of *Bairdiella*, Gill, for *B. armata*, Gill, and allies: JORDAN & EVERMANN, *t. c.* p. 1433.
- Zestis*, subg. n. of *Stellifer*, Cuv., for *S. oscitans*, J. & G., and *S. furthi*, Stdr.: JORDAN & EVERMANN, *t. c.* p. 1439. *Zestidium*, subg. n., for *S.*

- illecebrosus*, sp. n. (GILBERT), *iid. ibid.* p. 1442, Panama. *Stellicarens*, subg. n., for *S. zestocarus*, sp. n. (GILBERT), *iid. ibid.* p. 1445, Panama. *Sigmurus*, subg. n. of *Ophioscion*, Gill, for *O. vermicularis*, Gthr.: JORDAN & EVERMANN, *t. c.* p. 1447.
- Ophioscion simulus*, sp. n. (GILBERT), JORDAN & EVERMANN, *t. c.* p. 1449, Panama.
- Paralonchurus goodii*, sp. n. (GILBERT), JORDAN & EVERMANN, *t. c.* p. 1480, Panama.
- Eques viola*, sp. n. (GILBERT), JORDAN & EVERMANN, *t. c.* p. 1486.

ACRONURIDÆ.

- Acanthurus goramensis*, Blkr., figured by JATZOW & LENZ, Abh. Senck. Ges. xxi, pl. xxxvi, fig. 11.
- Naseus vomer*, Klunz. Note by STEINDACHNER, SB. Ak. Wien, cvii, 1, p. 786.

TRICHIURIDÆ.

- Lepidopus caudatus*, Euphr., recorded from the Aberdeen Coast: G. SIM, Ann. Scott. Nat. Hist. 1898, p. 53.

CARANGIDÆ.

- Decapterus leptosomus*, sp. n., DOUGLAS OGILBY, P. Linn. Soc. N. S. Wales, xxii, p. 760, Port Jackson.
- Oligoplites mundus*, sp. n., JORDAN & EVERMANN, Fish. N. Am. iii, p. 2844, W. Coast of Mexico.
- Hemicaranx zelotes*, sp. n. (GILBERT), JORDAN & EVERMANN, *t. c.* p. 2845, Panama.
- Equula klunzingeri*, sp. n., STEINDACHNER, SB. Ak. Wien, cvii, 1, p. 782, pl. i, fig. 2, Red Sea.

CYTTIDÆ.

- On the osteology of *Zeus faber*: STARKS, P. U. S. Mus. xxi, pp. 469-476, pls. xxxiii-xxxviii.

STROMATEIDÆ.

- Centrolophus niger*, Gm. On a specimen from the coast of Massachusetts: B. A. BEAN, P. U. S. Mus. xxi, p. 639.

CORYPHÆNIDÆ.

- Acrotus willoughbyi*, Bean. On a specimen from Port Townsend, Washington: B. A. BEAN, P. U. S. Mus. xxi, p. 640.

NOMEIDÆ.

- Bathyseriola cyanea*, Alc., figured by ALCOCK, Ill. Zool. Investig. pl. xviii, fig. 1.

SCOMBRIDÆ.

- Pelamys chilensis*, C. & V., figured by WAITE, Rep. Fish. 'Thetis,' pl. vi.

TRACHINIDÆ.

- Esloscopus*, subg. n. of *Dactyloscopus*, Gill, for *D. zelotes*, sp. n., JORDAN & EVERMANN, Fish. N. Am. iii, p. 2303, Panama.
- Lopholatilus chamæleonticeps*, Goode & Bean. On its reappearance : H. C. BUMPUS, Science (2) viii, p. 576.
- Pseudochromis caudalis*, sp. n., BOULENGER, Ann. Nat. Hist. (7) ii, p. 134, Sind.
- Gnathypops snyderi*, sp. n., JORDAN & EVERMANN, Fish. N. Am. iii, p. 2285, Gulf of California.
- Aphritis*, C. & V. Remarks by DOUGLAS OGILBY, P. Linn. Soc. N. S. Wales, xxii, p. 554.
- Bovichthys diacanthus*, C. & V., described and figured by STEINDACHNER, Zool. Jahrb., Suppl. iv, p. 300, pl. xx, fig. 1.
- Notothenia*, Rich. On the species occurring in the Fuegian Archipelago : SMITT, Bih. Svenska Ak. xxiii, iv, No. 3, 3 pls.; *N. modesta*, sp. n., STEINDACHNER, Zool. Jahrb., Suppl. iv, p. 302, Magelhan Straits.
- Dissostichus*, g. n., allied to *Notothenia* : SMITT, Bih. Svenska Ak. xxiv, iv, No. 5, p. 3; *D. eleginoides*, sp. n., *id. ibid.* p. 4, pl. i, figg. 1-11, Tierra del Fuego.
- Chaenichthys esox*, Gthr., described and figured by SMITT, *t. c.* p. 7, pl. i, figg. 12-15.
- Cottoperca gobio*, Gthr., described and figured by SMITT, *t. c.* p. 13, pl. i, fig. 16, & pl. ii, figg. 18-20.
- Harpagifer bispinis*, Forst., described and figured by SMITT, *t. c.* p. 17, pl. ii, figg. 21-24.
- Eleginus maclovinus*, Cuv., described by SMITT, *t. c.* p. 23.

BATRACHIDÆ.

- Dæctor*, g. n., allied to *Thalassophryne*, Gthr., for *D. dowi*, Jord. & Gilb. : JORDAN & EVERMANN, Fish. N. Am. iii, p. 2325.

PEDICULATI.

- Halieutæa coccinea*, Alc., and *nigra*, Alc., figured by ALCOCK, Ill. Zool. Investig. pl. xix, figg. 1 & 2.
- Lophius indicus*, Alc., figured by ALCOCK, *op. cit.* fig. 3.
- Malthopsis lutea*, Alc., figured by ALCOCK, *op. cit.* fig. 4. Also note in Ann. Nat. Hist. (7) ii, p. 152.
- Halicmetus ruber*, Alc., figured by ALCOCK, *op. cit.* fig. 5.
- Dibranchius micropus*, Alc., and *nasutus*, Alc., figured by ALCOCK, *op. cit.* pl. xx, figg. 1 & 2.
- Minous inermis*, Alc., figured by ALCOCK, Ill. Zool. Investig. pl. xviii, fig. 3.
- Antennarius horridus*, Blkr., figured by JATZOW & LENZ, Abh. Senckenb. Ges. xxi, pl. xxxv, fig. 7.

COTTIDÆ.

- Cottus*, L. Note on the northern marine species : LÜTKEN, Ichth. Ingolf Exped. p. 35; *C. pæcilopus*, Heck., distinct from *C. gobio*, L. : L. G. ANDERSSON, Bih. Svenska Ak. Handl. xxv, iv, No. 3. *C. klamathensis*, *evermanni*, and *princeps*, spp. nn., GILBERT, Bull. U. S. Fish Comm. xvii, pp. 10-12, figg., Oregon.
- Cottunculus microps*, Coll., *torvus*, Goode, and *inermis*, Vaill. Notes by LÜTKEN, *op. cit.* pp. 33-35.
- Oligocottus snyderi*, n. n. for *O. maculosus*, Jord. & Everm. *nec* Girard : JORDAN & EVERMANN, Fish. N. Am. iii, p. 2871.

- Alcidea*, g. n., for *Paricelinus thoburni*, Gilb. : JORDAN & EVERMANN, Fish. N. Am. ii, p. 1886.
- Archistes*, g. n., for *A. plumarius*, sp. n., JORDAN & EVERMANN, *t. c.* p. 1900, Ushishir Island, Behring Sea.
- Artediellus atlanticus*, sp. n., JORDAN & EVERMANN, *t. c.* p. 1906, Labrador to Cape Cod.
- Radulinus boleoides*, sp. n., JORDAN & EVERMANN, *t. c.* p. 1919, off Sta Catalina Island, California.
- Stelgistrum*, g. n., for *S. stejnegeri*, sp. n., JORDAN & EVERMANN, *t. c.* p. 1921, Robben Island, Behring Sea.
- Ceratocottus lucasi*, sp. n., JORDAN & EVERMANN, *t. c.* p. 1940, Behring Sea.
- Uranidea tenuis*, sp. n., EVERMANN & MEEK, Bull. U. S. Fish Comm. xvii, p. 83, fig., Klamath Lake, Oregon. *U. greenei*, sp. n., JORDAN & EVERMANN, *t. c.* p. 1965, Snake River Basin, Idaho.
- Myoxocephalus mednius*, sp. n. (B. A. BEAN), JORDAN & EVERMANN, *t. c.* p. 1983, Behring Sea.
- Porocottus quadratus*, sp. n. (B. A. BEAN), JORDAN & EVERMANN, *t. c.* p. 1998, Behring Island. *P. bradfordi* sp. n., *ibid.* *op. cit.* iii, p. 2862, Karluk, Alaska.
- Oxycottus*, g. n., for *Oligocottus acuticeps*, Gilb., and *O. embryum*, Jord. & Starks : JORDAN & EVERMANN, *t. c.* p. 2015.
- Oxycottus acuticeps*, Gilb. Note by T. H. & B. A. BEAN, P. U. S. Mus. xxi, p. 655.
- Sigmities*, g. n., near *Oxycottus*, for *S. caulias*, sp. n., JORDAN & EVERMANN, *t. c.* p. 2863, Karluk, Alaska.
- Nautiscus*, g. n., for *Nautichthys pribilovius*, Jord. & Gilb. : JORDAN & EVERMANN, *t. c.* p. 2019.
- Phobctor ventralis*, C. & V. Note by LÜTKEN, *op. cit.* p. 32.
- Artediellus* (*Centridermichthys*) *uncinatus*, Reinh., figured by LÜTKEN, *op. cit.* pl. iv, fig. 9.
- Triglops pingelii*, Reinh. Note by LÜTKEN, *op. cit.* p. 37.
- Pæcilia æningensis*, Winkler (foss.), is referred to the genus *Lepidocottus*, Sauv., by A. S. WOODWARD, Geol. Mag. (iv) v, p. 392.
- Platycephalus pristis*, Ptrs., figured by JATZOW & LENZ, Abh. Senck. Ges. xxi, pl. xxxiv, fig. 3.
- Thysanophrys*, g. n., for *Platycephalus cirronasus*, Richards. : DOUGLAS OGILBY, P. Linn. Soc. N. S. Wales, xxiii, p. 40.
- Lepidotrigla bispinosa*, sp. n., STEINDACHNER, SB. Ak. Wien, cvii, i, p. 780, pl. i, fig. 1, Red Sea.
- Prionotus tribulus*, C. & V. Note by EVERMANN & B. A. BEAN, Rep. U. S. Fish Comm. f. 1896, p. 248.
- Gurnardus* & *Merulinus*, subgg. nn. of *Prionotus*, Lacép., JORDAN & EVERMANN, Fish. N. Am. ii, p. 2148.

AGONIDÆ.

- Occa*, g. n., for *Brachyopsis verrucosus*, Lockingt., JORDAN & EVERMANN, Fish. N. Am. ii, p. 2043.
- Podotheucus hamlini*, sp. n., JORDAN & EVERMANN, *t. c.* p. 2056, Iturup Island, Kuril group.
- Peristethus investigatoris* & *serrulatum*, spp. nn., ALCOCK, Ann. Nat. Hist. (7) ii, pp. 152 & 153, Andaman Sea, 185–220 & 405 faths.
- Averruncus sterletus*, sp. n., JORDAN & EVERMANN, *t. c.* p. 2071, Coronado Island, S. California.
- Aspidophoroides olrickii*, Lütch., figured by LÜTKEN, Ichth. Ingolf Exped. p. 38.

DISCOBOLI.

- Neoliparis atlanticus*, p. 2107, Atlantic Coast of N. America, and *rutteri*, p. 2108, Alaska, spp. nn., JORDAN & EVERMANN, Fish. N. Am. ii.
- Liparis reinhardti*, Kr., and *micropus*, Gthr. Notes by LÜTKEN, Ichth. Ingolf Exped. p. 14; *L. herschelinus*, sp. n. (SCOFIELD), JORDAN & EVERMANN, t. c. p. 2123, Herschel Island, Arctic Ocean.
- Paraliparis bathybii*, Coll. Note by LÜTKEN, *op. cit.* p. 17.
- Crystallichthys*, g. n., closely allied to *Liparis*, JORDAN & EVERMANN, Fish. N. Am. iii, p. 2864; *C. mirabilis*, sp. n., *ibid.* p. 2865, Behring Sea.
- Allinectes*, n. n. for *Allurus*, Jord. & Everm. *nec* Forster, JORDAN & EVERMANN, t. c. p. 2866
- Prognurus*, g. n., allied to *Careproctus*, for *P. cypselurus*, sp. n., JORDAN & EVERMANN, t. c. iii, p. 2866.

GOBIIDÆ.

- Gobius marmoratus*, Pall. On specimens from the Gov. Kharkov: KAMENSKY, Trudui Kharkov Univ. xxix, 1896, p. 139, pl. iii; *G. oplopomus*, C. & V. Note by STEINDACHNER, SB. Ak. Wien, cvii, i, p. 786; *G. albomaculatus*, Rüpp., figured by JATZOW & LENZ, Abh. Senck. Ges. xxi, pl. xxxiv, fig. 4; *G. cometes*, Alc., figured by ALCOCK, Ill. Zool. Investig. pl. xx, fig. 3; *G. gilchristi*, sp. n., BOULENGER, Mar. Invest. S. Africa, i, Mossel Bay, Cape of Good Hope.
- Enypnias*, subg. n. of *Garmannia*, Jord. & Everm., for *Gobius seminudus*, Gthr.: JORDAN & EVERMANN, Fish. N. Am. iii, p. 2232.
- Trichopharynx*, g. n. for *Gobius crassilabris*, Gthr., DOUGLAS OGILBY, P. Linn. Soc. N. S. Wales, xxii, p. 769.
- Lophogobius cyprinoides*, Pall. Recorded from Florida and figured by EVERMANN & KENDALL, Bull. U. S. Fish Comm. xvii, p. 131, pl. ix, fig. 13.
- Gillichthys detrusus*, sp. n., GILBERT & SCOFIELD, P. U. S. Mus. xx, p. 498, pl. xxxviii, Colorado Basin, Mexico.
- Eleotris fohizonæ*, Stdr., figured by JATZOW & LENZ, Abh. Senck. Ges. xxi, pl. xxxiv, fig. 5.
- Caulichthys*, subg. n., for *Eleotris guentheri*, Blkr. and allies: DOUGLAS OGILBY, P. Linn. Soc. N. S. Wales, xxii, p. 784.
- Austrogobio*, subg. n., for *Carassiops galii*, sp. n., DOUGLAS OGILBY, t. c. p. 788, New South Wales.
- Ophiorrhinus angustifrons*, sp. n., DOUGLAS OGILBY, t. c. p. 793, New South Wales.
- Sicydium vincente*, sp. n., JORDAN & EVERMANN, Fish. N. Am. iii, p. 2207, St Vincent, W. I.
- Sicyosus*, n. n. for *Sicya*, Jord. & Everm., preoccupied: JORDAN & EVERMANN, t. c. p. 2867.
- Bembrops gobioides*, Goode, figured by ALCOCK, Ill. Zool. Investig. pl. xx, fig. 6.
- Amblyopus arctocephalus*, Alc., figured by ALCOCK, *op. cit.* pl. xx, fig. 7.
- Callionymus lyra*, L. Figure of breeding male, and observations on the secondary sexual characters and breeding habits: HOLT, P. Z. S. 1898, p. 281, figg., pl. xxvi; *C. carebares*, Alc., figured by ALCOCK, *op. cit.* pl. xx, fig. 4; *C. cæruleomaculatus*, sp. n., JATZOW & LENZ, Abh. Senck. Ges. xxi, p. 510, pl. xxxv, fig. 6, Zanzibar; *C. costatus*, sp. n., BOULENGER, Mar. Invest. S. Africa, i, off Cape St Blaize, Cape of Good Hope.

BLENNIIDÆ.

- Blennius canariensis*, sp. n., JORDAN & GUNN, P. Ac. Philad. 1898, p. 346, Canary Islands; *B. variopunctatus*, sp. n., JATZOW & LENZ, Abh. Senck. Ges. xxi, p. 511, pl. xxxv, fig. 8, Zanzibar.
- Alectrias*, g. n. for *Blennius alectrolophus*, Pall., JORDAN & EVERMANN, Fish. N. Am. iii, p. 2869.
- Blenniulus*, subg. n. of *Hypsoblennius*, Gill, for *Blennius brevipinnis*, Gthr., JORDAN & EVERMANN, t. c. p. 2390.
- Homesthes*, g. n., near *Hypsoblennius*, for *H. caulopus*, sp. n., JORDAN & EVERMANN, t. c. p. 2394, Panama Bay.
- Scartichthys*, g. n., for *Salarias rubropunctatus*, C. & V., JORDAN & EVERMANN, t. c. p. 2395.
- Ophioblennius steindachneri*, sp. n., JORDAN & EVERMANN, t. c. p. 2401, W. Coast of Mexico.
- Emblemaria atlantica*, sp. n., JORDAN & EVERMANN, t. c. p. 2402, off Pensacola, Florida.
- Enedrias*, g. n., for *Gunellus nebulosus*, Schleg., JORDAN & EVERMANN, t. c. p. 2414.
- Rhodymenichthys*, subg. n. of *Pholis*, Gronow, for *P. dolichogaster*, Pall., JORDAN & EVERMANN, t. c. p. 2415.
- Chasmodes saburrae*, J. & G. Note by EVERMANN & B. A. BEAN, Rep. U. S. Fish Comm. f. 1896, p. 247.
- Cristiceps argentinus*, sp. n., BERG, Com. Mus. Buenos Ayres, i, p. 12, Cape Corrientes, Buenos Ayres.
- Corallicola*, subg. n. for *Auchenopterus nigripinnis*, Stdr., and allies, JORDAN & EVERMANN, Fish. N. Am. iii, p. 2369.
- Tripterygium cunninghami*, sp. n., SMITT, Bih. Svenska Ak. xxiv, iv, No. 5, p. 26, pl. iii, figg. 26–28, Tierra del Fuego.
- Eucentronotus*, g. n., allied to *Xiphidion*, Gir., for *E. zietzi*, sp. n., DOUGLAS OGILBY, P. Linn. Soc. N. S. Wales, xxiii, p. 294, St Vincent's Gulf, S. Australia.
- Petroscirtes variabilis*, Cant., figured by JATZOW & LENZ, Abh. Senck. Ges. xxi, pl. xxxvi, fig. 10; *P. striatus*, sp. n., *id. ibid.* p. 512, pl. xxxv, fig. 9, Zanzibar.
- Salarias curtus*, Blgr. = *S. opercularis*, Murray, = *S. neilli*, Day, BOULENGER, Ann. Nat. Hist. (7) ii, p. 134; *S. viridis*, C. & V., and *gigas*, Stdr., figured by STEINDACHNER, Zool. Jahrb., Suppl. iv, pl. xix, figg. 6 & 7; *S. eques*, sp. n., *id. ibid.* p. 307, pl. xix, fig. 5, Chili.

MASTACEMBELIDÆ.

- Mastacembelus*, Gronow. Synopsis of the African species: BOULENGER, Tr. Z. S. xv, p. 23; *M. moorii*, p. 22, pl. vii, fig. 1, Lake Tanganyika, *liberiensis*, p. 23, Liberia, *loennbergii*, p. 23, Cameroons, *flavomarginatus*, p. 23, Gaboon, and *nigromarginatus*, p. 23, Ashantee, spp. nn., *id. ibid.*

ATHERINIDÆ.

- Atherina voeltzkowi*, sp. n., JATZOW & LENZ, Abh. Senck. Ges. xxi, p. 515, pl. xxxvi, fig. 12, Zanzibar.
- Teniomembras*, g. n. for *Atherina microstoma*, Gthr., DOUGLAS OGILBY, P. Linn. Soc. N. S. Wales, xxiii, p. 41.
- Atherinichthys nigricans*, and *regia*, spp. nn., SMITT, Bih. Svenska Ak. xxiv, iv, No. 5, pp. 29 & 31, pl. iv, figg. 29–31, Tierra del Fuego.
- Chirostoma affine* and *gracile*, spp. nn., STEINDACHNER, Zool. Jahrb., Suppl. iv, pp. 313 & 314, Chili.

MUGILIDÆ.

- Mugil incilis*, Hanc. Note by VAILLANT, Notes Leyd. Mus. xx, p. 15. *M. so-iny*, Basil., redescribed by GÜNTHER, Ann. Nat. Hist. (7) i, p. 260.
Myrus elongatus, Gthr., figured by WAITE, Rep. Fish. 'Thetis,' pl. xii.

CENTRISCIDÆ.

- Centriscus scolopax*, L., figured by WAITE, Rep. Fish. 'Thetis,' pl. vii.

GOBIESOCIDÆ.

- Gobiesox gyrinus*, sp. n., JORDAN & EVERMANN, Fish. N. Am. iii, p. 2331, West Indies.
Bryssophilus, subg. n., for *Gobiesox papillifer*, Gilb., JORDAN & EVERMANN, t. c. p. 2329.

TRACHYPTERIDÆ.

- Trachypterus*, Gouan. Remarks on the South Pacific species: DOUGLAS OGILBY, P. Linn. Soc. N. S. Wales, xxii, p. 646; *T. jacksoniensis polystictus*, subsp. n., *id. ibid.* p. 649, New South Wales.
Regalecus argenteus, Park. Notes on specimens from the Taranaki Coast, New Zealand: F. E. CLARKE, Tr. N. Zeal. Inst. xxx, p. 254, pls. xxviii-xxx; On a young specimen: S. H. DREW, t. c. p. 253.

NOTACANTHIDÆ.

- On the specimens obtained by the 'Ingolf' Expedition in the Arctic Ocean: LÜTKEN, Ichth. Ingolf Exped. p. 11.

ACANTHOPTERYGII PHARYNGOGNATHI.

POMACENTRIDÆ.

- Amphiprion intermedius*, Schleg., figured by JATZOW & LENZ, Abh. Senck. Ges. xxi, pl. xxxvi, fig. 13.
Pomacentrus annulatus, Pters., figured by JATZOW & LENZ, t. c. pl. xxxvi, fig. 14.
Glyphidodon amboinensis, Blkr., figured by JATZOW & LENZ, t. c. pl. xxxvi, fig. 15.
Azurina, g. n., allied to *Heliastes*, C. & V., for *A. hirundo*, sp. n., JORDAN & EVERMANN, Fish. N. Am. ii, p. 1544, W. Coast of Mexico.

LABRIDÆ.

- Labrus maculatus*, Don. An observation of the colour-changes: HOLT & BYRNE, J. Mar. Biol. Ass. (2) v, p. 193.
Iridio kirschii, sp. n., JORDAN & EVERMANN, Fish. N. Am. ii, p. 1598, Caribbean Sea.
Thalassoma unimaculatum, Lowe, redescribed by JORDAN & GUNN, P. Ac. Philad. 1898, p. 343.
Labrichthys caudovittatus, sp. n., STEINDACHNER, SB. Ak. Wien, cvii, i, p. 783, pl. i, fig. 3, Red Sea.

- Teniolabrus cyclograptus*, Alc., figured by ALCOCK, Ill. Zool. Investig. pl. xx, fig. 5.
Novacula jacksoniensis, Rams., figured by WAITE, Rep. Fish. 'Thetis,' pl. viii.
Coris julis, L. and *C. giofredi*, Risso, probably forms of one dimorphic species: HOLT, Bull. Mus. Marseille, i, p. 151, figg.
Platygllossus maculatus, sp. n., JATZOW & LENZ, Abh. Senck. Ges. xxi, p. 520, pl. xxxvi, fig. 16, Zanzibar.

CHROMIDES.

- G. A. BOULENGER, P. Z. S. 1898, pp. 132-152, brings out the first part of a revision of these Fishes, named *Cichlidae*, with a synopsis of the genera.
Heros goeldii, Blgr., figured by GOELDI, Bol. Mus. Para. ii, pl., fig. 2.
Lamprologus fasciatus, p. 7, pl. i, fig. 2, *compressiceps*, p. 7, pl. i, fig. 3, *moorii*, p. 8, pl. i, fig. 4, *modestus*, p. 8, pl. i, fig. 5, *elongatus*, p. 9, pl. i, fig. 6, and *furcifer*, p. 9, pl. ii, fig. 1, spp. nn., BOULENGER, Tr. Z. S. xv, Lake Tanganyika.
Telmatochromis, g. n., BOULENGER, t. c. p. 10; *T. vittatus*, p. 10, pl. ii, fig. 2, and *temporalis*, p. 11, pl. ii, fig. 3, spp. nn., *id. ibid.*, Lake Tanganyika.
Julidochromis, g. n., BOULENGER, t. c. p. 11; *J. ornatus*, sp. n., *id. ibid.* p. 12, pl. ii, fig. 4, Lake Tanganyika.
Paratilapia pfefferi, p. 12, pl. iii, fig. 1, *macrops*, p. 13, pl. iii, fig. 2, *ventralis*, p. 13, pl. iii, fig. 3, *furcifer*, p. 14, pl. iv, fig. 1, and *leptosoma*, p. 14, pl. iii, fig. 4, spp. nn., BOULENGER, t. c., Lake Tanganyika; *P. voeltzkowi*, sp. n., JATZOW & LENZ, Abh. Senck. Ges. xxi, p. 522, pl. xxxvi, fig. 17, Zanzibar?
Bathybates, g. n., BOULENGER, t. c. p. 15; *B. ferox*, sp. n., *id. ibid.* pl. iv, fig. 2, Lake Tanganyika.
Pelmatochromis lateralis, n. n. for *P. guentheri*, Blgr. nec Sauvage, BOULENGER, P. Z. S. 1898, p. 148; *P. welwitschi*, sp. n., *id. ibid.* p. 149, pl. xix, fig. 1, Angola.
Chromidotilapia, g. n., BOULENGER, t. c. p. 151; *C. kingsleyæ*, sp. n., *id. ibid.* pl. xix, fig. 2, Ogowe.
Eretmodus, g. n., BOULENGER, Tr. Z. S. xv, p. 16; *E. cyanocinctus*, sp. n., *id. ibid.* pl. iii, fig. 5, Lake Tanganyika.
Ectodus, g. n., BOULENGER, t. c. p. 21; *E. descampsi* and *melanogenys*, spp. nn., *id. ibid.*, figg., Lake Tanganyika.
Tilapia labiata, sp. n., BOULENGER, t. c. p. 17, pl. v, fig. 1, Lake Tanganyika.
Tropheus, g. n., BOULENGER, t. c. p. 17; *T. moorii*, sp. n., *id. ibid.* p. 18, pl. v, fig. 2, Lake Tanganyika.
Simochromis, g. n., for *Chromis diagramma*, Gthr., BOULENGER, t. c. p. 19.
Petrochromis, g. n., BOULENGER, t. c. p. 20; *P. polyodon*, sp. n., *id. ibid.* pl. vi, fig. 1, Lake Tanganyika.
Perissodus, g. n., BOULENGER, t. c. p. 20; *P. microlepis*, sp. n., *id. ibid.* p. 21, pl. vi, fig. 2, Lake Tanganyika.
Plecodus, g. n., BOULENGER, t. c. p. 22; *P. paradoxus*, sp. n., *id. ibid.*, fig., Lake Tanganyika.

ANACANTHINI.

LYCODIDÆ.

- Lycodes*, Reinh. On the specimens obtained by the 'Ingolf' Expedition in the N. Atlantic Ocean: LÜTKEN, Ichth. Ingolf Exped. p. 19; *L.*

- sarsii*, Coll., described and figured by COLLETT, Vidensk. Skrift. i, No. 1, 2 pls.; *L. (Phucocætes) platei*, sp. n., STEINDACHNER, Zool. Jahrb., Suppl. iv, p. 320, pl. xix, fig. 8, Tierra de Fuego; *L. (Ilucocætes) fimbriatus*, Jen., described and figured: *id. ibid.* p. 322, pl. xx, fig. 10.
- Platea*, g. n., allied to *Lycodes*, for *P. insignis*, sp. n., STEINDACHNER, *t. c.* p. 323, pl. xx, fig. 12, Tierra de Fuego.
- Embryx*, g. n., for *Lycodopsis crassilabris*, Gilb., JORDAN & EVERMANN, Fish. N. Am. iii, p. 2458.
- Lycias*, subg. n., for *Lycodes nebulosus*, Kröy., and *L. seminudus*, Reinh., JORDAN & EVERMANN, *t. c.* p. 2463.
- Phucocætes variegatus*, Gthr., and *latitans*, Jen., described and figured by SMITT, Bih. Svenska Ak. xxiv, iv, No. 5, pp. 43–51, pl. v, figg. 32–39.

GADIDÆ.

- Gadus*, L. On the food of the American species: W. C. KENDALL, Rep. U. S. Fish Comm. f. 1896, p. 177; *G. morrhua*, L. On various malformations: A. PATTERSON, Zoologist, lvi, p. 130, fig.; *G. æglefinus*, L. On a very small specimen: HOLT, P. Z. S. 1898, p. 551, pl. xlvii, fig. 12.
- Emphyicus*, subg. n. of *Urophycis*, Gill, for *Phycis tenuis*, Mitch., and allies, JORDAN & EVERMANN, Fish. N. Am. iii, p. 2552.
- Physiculus argyropastus*, Alc., figured by ALCOCK, Ill. Zool. Investig. pl. xxii, fig. 1.
- Haloporphyrus eques*, Gthr., figured by LÜTKEN, Ichth. Ingolf Exped. pl. iv, fig. 7.
- Motella (Onos) reinhardti*, Kr., figured by LÜTKEN, *t. c.* pl. iv, fig. 8.

OPHIDIIDÆ.

- Ogilbia*, g. n., allied to *Dinematichthys*, EVERMANN & KENDALL, Bull. U. S. Fish Comm. xvii, p. 132; *O. cayorum*, sp. n., *id. ibid.* p. 133, pl. ix, fig. 14, Florida.
- Rhodichthys regina*, Coll., figured by LÜTKEN, Ichth. Ingolf Exped. pl. iii, fig. 4.
- Neobythites squamipinnis*, Alc., and *steatiticus*, Alc., figured by ALCOCK, Ill. Zool. Investig. pl. xxi, figg. 1 & 2.
- Tauredophidium hextii*, Alc., figured by ALCOCK, *l. c.* fig. 3.
- Dermatorus melanocephalus*, Alc., figured by ALCOCK, *l. c.* fig. 4.
- Hephthocara simum*, Alc., figured by ALCOCK, *op. cit.* pl. xxii, fig. 3.
- Diplacanthopoma raniceps*, sp. n., ALCOCK, Ann. Nat. Hist. (7) ii, p. 154, Andaman Sea, 405 faths.
- Fierasfer*, sp. On a post-larval specimen from the West Coast of Ireland: McINTOSH, Irish Natural. vii, p. 61, pl. ii.
- Rhynchias*, g. n. for *Ammodytes septipinnis*, Pall. (GILL), JORDAN & EVERMANN, Fish. N. Am. iii, p. 2841.

MACRURIDÆ.

- Macrurus fabricii*, Sund., *rupestris*, Gunn., *goodii*, Gthr., and *simulus*, Goode & Bean. Notes by LÜTKEN, Ichth. Ingolf Exped. pp. 24, 26, 28; *M. ingolfi*, sp. n., *id. ibid.* p. 27, off Iceland, 845–1300 faths.
- Albatrossia*, g. n. for *Macrurus pectoralis*, Gilb., JORDAN & EVERMANN, Fish. N. Am. iii, p. 2573.
- Bogoslovius*, g. n., close to *Chalinura*, for *B. clarki*, sp. n., JORDAN & EVERMANN, *t. c.* p. 2574, Behring Sea.

PLEURONECTIDÆ.

- H. C. DANNEVIG, Rep. Fish. Board Scotland, xvi, Pt. III, pp. 219-224, records experiments on the rearing of various British Pleuronectoids; H. M. KYLE, *t. c.* pp. 225-247, pls. x & xi, describes their post-larval stages.
- Hippoglossoides hamiltoni*, sp. n., JORDAN & EVERMANN, Fish. N. Am. iii, p. 2616, Kamchatka.
- Verasper*, g. n., allied to *Xystreurys* and *Hippoglossina*, for *V. moseri*, sp. n., JORDAN & EVERMANN, *t. c.* p. 2618, Kuril Id. and Hakodati.
- Ramularia*, g. n., for *Ancyllopsetta dendritica*, Gilb., JORDAN & EVERMANN, *t. c.* p. 2633.
- Perissias*, g. n., for *Platophrys tæniopterus*, Gilb., JORDAN & EVERMANN, *t. c.* p. 2667.
- Boopsetta umbrarum*, Alcock, = *Pacilopsetta prælonga*, Alcock, ALCOCK, Ann. Nat. Hist. (7) ii, p. 156.
- Rhombus maximus*, L. On a bicoloured specimen with arrested migration of the eye: MARIA SACCHI, Boll. Mus. Univ. Genova, 1898, No. 67, pl.
- Brachypleura xanthosticta*, Alc., figured by ALCOCK, Ill. Zool. Investig. pl. xxii, fig. 2.
- Arnoglossus brevirectis*, Alc., and *macrolophus*, Alc., figured by ALCOCK, *op. cit.* pl. xxii, fig. 4, & pl. xxiii, fig. 3; *A. fisoni*, sp. n., DOUGLAS OGILBY, P. Linn. Soc. N. S. Wales, xxiii, p. 295, Moreton Bay; *A. capensis*, sp. n., BOULENGER, Mar. Invest. S. Afr. i, p. 1, False Bay, S. Africa.
- Scianectes macrophthalmus*, Alc., figured by ALCOCK, *op. cit.* pl. xxiii, fig. 1.
- Samaris cristatus*, Gray, figured by ALCOCK, *op. cit.* pl. xxiii, fig. 2.
- Læops guentheri*, Alc., figured by ALCOCK, *op. cit.* pl. xxiii, fig. 4.
- Rhomboidichthys valderostratus*, Alc., *azureus*, Alc., and *polylepis*, Alc., figured by ALCOCK, *op. cit.* pl. xxiv, figg. 2, 3, 4.
- Pleuronectes flesus*, L. Statistical investigations on the variations in the fin-rays: G. DUNCKER, J. Mar. Biol. Ass. (2) v, p. 172; *P. americanus*, Walb. On variations in the fin-rays: H. C. BUMPUS, Amer. Nat. xxxii, p. 407.
- Paralichthys magdalenæ*, p. 2871, Magdalena Bay, Lower California, and *sinaloæ*, p. 2872, Mazatlan, spp. nn., JORDAN & EVERMANN, Fish. N. Am. iii, p. 2872; *P. estuarius*, sp. n., GILBERT & SCOFIELD, P. U. S. Mus. xx, p. 499, pl. xxxix, Mouth of Colorado R., Mexico; *P. jordani*, sp. n., STEINDACHNER, Zool. Jahrb., Suppl. iv, p. 325, Chili; *P. cæruleosticta*, sp. n., *id. ibid.* p. 327, Juan Fernandez; *P. novæ-cambiæ*, sp. n., DOUGLAS OGILBY, P. Linn. Soc. N. S. Wales, xxiii, p. 296, Coast of New South Wales.
- Solea macleayana*, Rams., figured by WAITE, Rep. Fish. 'Thetis,' pl. ix.
- Synaptura fasciata*, Macleay, figured by WAITE, *op. cit.* pl. x; *S. altipinnis*, Alc., figured by ALCOCK, *op. cit.* pl. xxiv, fig. 1.
- Cynoglossus carpenteri*, Alc., *versicolor*, Alc., and *præcisus*, Alc., figured by ALCOCK, *op. cit.* pl. xxii, fig. 5, and pl. xxiii, figg. 5 & 6; *C. semilævis*, Gthr., and *gracilis*, Gthr. Notes by GÜNTHER, Ann. Nat. Hist. (7) i, p. 261.

PHYSOSTOMI.

SILURIDÆ.

- Clarias liocephalus*, sp. n., BOULENGER, Tr. Z. S. xv, p. 24, pl. vii, fig. 2, Lake Tanganyika.

- Endorrhis*, g. n., for *Copidoglanis longifilis*, Macleay, DOUGLAS OGILBY, P. Linn. Soc. N. S. Wales, xxiii, p. 283.
- Silurus glanis*, L. On a specimen with atrophied pectoral fin: JAQUET, Bull. Soc. Bucharest, vii, p. 496, fig.
- Silurus calvarius*, Basil., = *Macrones vachellii*, Richards., GÜNTHER, Ann. Nat. Hist. (7) i, p. 261.
- Ictalurus anguilla*, sp. n., EVERMANN & KENDALL, Bull. U. S. Fish Comm. xvii, p. 125, pl. vi, fig. 1, Louisiana.
- Platystoma vaillanti*, Cuv., figured by GOELDI, Bol. Mus. Para. ii, pl., fig. 3.
- Brachyplatystoma*, Eigenm. *Platystoma juruense*, sp. n., BOULENGER, Tr. Z. S. xiv, p. 421, pl. xxxix, R. Jurua, Brazil; *B. platynema*, sp. n., *id.* Ann. Nat. Hist. (7) ii, p. 477, R. Jurua.
- Paulicea*, g. n., for *Platystoma luetkeni*, Stdr., and *P. jahu*, sp. n., IHERING, P. Ac. Philad. 1898, p. 109, S. Paulo, Brazil.
- Pimelodus (Rhamdia) parvus*, sp. n., BOULENGER, Boll. Mus. Torino, xiii, No. 329, p. 7, Ecuador.
- Nedystoma*, g. n., for *Hemipimelodus dayi*, Rams. & Ogilb., DOUGLAS OGILBY, P. Linn. Soc. N. S. Wales, xxiii, p. 32.
- Pachyula*, g. n., for *Hemipimelodus crassilabris*, Rams. & Ogilb., DOUGLAS OGILBY, *t. c.* p. 33.
- Anoplopterus*, Pfeff. *Chimarrhoglanis leroyi*, Vaill., = *Pimelodus platychir*, Gthr., BOULENGER, Ann. Nat. Hist. (7) i, p. 255.
- Piratinga pira-aiba*, sp. n., GOELDI, Bol. Mus. Para. ii, p. 477, pl., fig. 4, Para [no description].
- Arius seemanni*, Gthr. (= *Galeichthys gilberti*, Jord.). Note by BOULENGER, Boll. Mus. Torino, xiii, No. 329, p. 5; *A. festæ* and *labiatus*, spp. nn., *id. ibid.* pp. 5 & 6, Ecuador; *A. mastersi*, p. 34, *proximus*, p. 280, and *stirlingi*, p. 281, spp. nn., DOUGLAS OGILBY, P. Linn. Soc. N. S. Wales, xxiii, N. Australia.
- Cinetodus*, g. n., for *Arius froggati*, Rams. & Ogilb., DOUGLAS OGILBY, P. Linn. Soc. N. S. Wales, xxiii, p. 32.
- Aspistor*, g. n., for *Arius luniscutis*, C. & V., JORDAN & EVERMANN, Fish. N. Am. iii, p. 2763.
- Galeichthys xenauchen*, sp. n. (GILBERT), JORDAN & EVERMANN, *t. c.* p. 2777, Panama.
- Tachysurus emmelane*, sp. n. (GILBERT), JORDAN & EVERMANN, *t. c.* p. 2785, Panama.
- Oxydoras trimaculatus*, p. 422, fig. 1, *trachyparia*, p. 423, fig. 2, *bachi*, p. 423, fig. 3, and *elongatus*, p. 424, fig. 4, spp. nn., BOULENGER, Tr. Z. S. xiv, pl. xl, R. Jurua, Brazil.
- Leptodoras*, g. n., BOULENGER, Ann. Nat. Hist. (7) ii, p. 477, for *Oxydoras acipenserinus*, Gthr., and *L. juruensis*, sp. n., *id. ibid.* p. 478, R. Jurua.
- Synodontis*, Cuv., L. VAILLANT & A. PETTIT, Bull. Mus. Paris, 1898, pp. 264–267, investigate the structure of the villose skin of *S. schall*, Forsk.; *S. citernii*, sp. n., VINCIGUERRA, Ann. Mus. Genova (2) xix, p. 247, L. Rudolf; *S. multipunctatus*, sp. n., BOULENGER, Tr. Z. S. xv, p. 24, pl. viii, Lake Tanganyika; *S. obesus*, sp. n., *id.* Ann. Nat. Hist. (7) ii, p. 415, Old Calabar.
- Oxyglanis*, g. n., allied to *Synodontis*, VINCIGUERRA, *t. c.* p. 249; *O. sacchii*, sp. n., *id. ibid.* p. 250, Omo R., Gallaland.
- Rhinoglanis vannutellii*, sp. n., VINCIGUERRA, *t. c.* p. 254, L. Rudolf.
- Arges prenadilla*, C. & V. Note by BOULENGER, Boll. Mus. Torino, xiii, No. 329, p. 9; *A. festæ*, sp. n., *id. ibid.*, Ecuador.
- Chaetostomus dermorhynchus*, Blgr. Note by BOULENGER, Boll. Mus. Torino, xiii, No. 329, p. 12; *C. platycephalus*, sp. n., *id. ibid.*, Ecuador; *C. bachi*, sp. n., *id.*, Tr. Z. S. xiv, p. 425, pl. xli, fig. 1, R. Jurua, Brazil.

- Plecostomus spinosissimus*, Stdr. Note by BOULENGER, Boll. Mus. Torino, xiii, No. 329, p. 10; *P. festæ*, sp. n., *id. ibid.* p. 11, Ecuador.
- Hypoptopoma guentheri*, Blgr. = *Aristommata inexpectata*, Holmberg, BERG, Com. Mus. Buenos Ayres, i, p. 11.
- Loricaria filamentosa*, Stdr. Note by VAILLANT, Notes Leyd. Mus. xx, p. 7.
- Acestra gladius*, sp. n., BOULENGER, Tr. Z. S. xiv, p. 425, pl. xli, fig. 2, R. Jurua, Brazil.
- Aspredo tibicen*, C. & V. On the fungiform ventral appendages and the mode of attachment of the eggs: VAILLANT, C.R. Ac. Sci. cxxvi, p. 544, and Notes Leyd. Mus. xx, p. 9, fig.
- Trichomycterus kneri*, Stdr. Note by BOULENGER, Boll. Mus. Torino, xiii, No. 329, p. 8; *T. eigenmanni*, n. n. for *T. kneri*, Eigenm. *nec* Stdr., *id. ibid.*
- Cetopsis macroteronema*, sp. n., BOULENGER, Boll. Mus. Torino, xiii, No. 329, p. 8, Ecuador.
- Vandellia cirrhosa*, C. & V. Remarks by BOULENGER, P. Z. S. 1897, pp. 901 & 920, and Tr. Z. S. xiv, p. 426.

SCOPELIDÆ.

- Bathypterois atricolor*, Alcock. Note by ALCOCK, Ann. Nat. Hist. (7) ii, p. 146.
- Æthoprora perspicillata*, sp. n., DOUGLAS OGILBY, P. Linn. Soc. N. S. Wales, xxiii, p. 36, Lord Howe Island.
- Scopelus glacialis*, Reinh. On larvæ and very young specimens: HOLT, P. Z. S. 1898, p. 552, pl. xlv, figg. 1-5, & pl. xlvii, figg. 6 & 7.
- Cyclothone microdon*, Gthr. Note by LÜTKEN, Ichth. Ingolf Exped. p. 9; *C. megalops*, sp. n., *id. ibid.* p. 10, pl. iv, fig. 6, between Iceland and Greenland, 1040 faths.
- Zaphotias*, n. n. for *Bonapartia*, Goode & Bean, JORDAN & EVERMANN, Fish. N. Am. iii, p. 2826.
- Enchodus parvus* and *amicrodus*, spp. nn. (foss.), A. STEWART, Kansas Quart. vii, pp. 192 & 193, fig., Kansas Cretaceous.
- Osmeroides megapterus*, Pict. (foss.). Note on the type specimen: A. S. WOODWARD, Ann. Nat. Hist. (7) ii, p. 487; referred to *Sardinoides*, Marck, p. 406.
- Clupea laticauda*, Pict. (foss.). Note on the type specimen: A. S. WOODWARD, *t. c.* p. 488.

CYPRINIDÆ.

- Catostomus latipinnis*, B. & G., *discobolus*, Cope, & *gila*, Kirsch. Notes by GILBERT & SCOFIELD, P. U. S. Mus. xx, pp. 489, 490, 491; *C. rimiculus*, sp. n., GILBERT, Bull. U. S. Fish Comm. xvii, p. 3, Trinity and Scott Rivers, Northern California; *C. snyderi*, sp. n., *id. ibid.*, Upper Klamath Lake, Oregon; note by EVERMANN & MEEK, *t. c.* p. 69; *C. tsiltcoosensis*, sp. n., EVERMANN & MEEK, Bull. U. S. Fish Comm. xvii, p. 68, fig., Tsiltcoos Lake, Oregon.
- Chasmistes copei*, sp. n., EVERMANN & MEEK, *t. c.* p. 70, fig., Klamath Lake, Oregon; *C. brevirostris*, Cope, redescribed by GILBERT, *t. c.* p. 4, fig.; *C. stomias*, sp. n., *id. ibid.* p. 5, fig., Klamath Lake, Oregon; note by EVERMANN & MEEK, *t. c.* p. 70.
- Deltistes luxatus*, Cope, redescribed by GILBERT, *t. c.* p. 6.
- Pantosteus arizonæ*, sp. n., GILBERT & SCOFIELD, *t. c.* p. 488, pl. xxxvi, Colorado Basin, Arizona.
- Xyrauchen cypho*, Lock. Note by GILBERT & SCOFIELD, *t. c.* p. 491.

- Cyprinus carpio*, L. On the races: B. HOFER, Allgem. Fischerei-Zeit. xxiii, pp. 37, 96, 153, 175, 187, 205, 257, 274; F. v. GAERTNER, *t. c.* p. 95.
- Carassius auratus*, L. On domestic varieties in Japan: KISHINOUE, Nat. Science, xiii, p. 39, figg.
- Catlocarpio*, g. n., allied to *Catla*, C. & V., BOULENGER, Ann. Nat. Hist. (7) i, p. 450; *C. siamensis*, sp. n., *id. ibid.* p. 451, Menam R.
- Labeo velifer*, p. 32, pl. xvi, *longipinnis*, p. 33, pl. xvii, fig. 1, *lineatus*, p. 34, pl. xviii, *falcifer*, p. 35, pl. xvii, fig. 2, *macrostoma*, p. 36, pl. xix, fig. 1, and *barbatus*, p. 36, pl. xix, fig. 2, spp. nn., BOULENGER, Ann. Mus. Congo, Zool. i, Congo.
- Capoeta gracilis*, pp. 686 & 694, pl. ii, fig. 2, and *tinca*, Heck., p. 687, pl. iii, fig. 1, described and figured by STEINDACHNER, Denkschr. Akad. Wien, lxiv; *C. steindachneri*, Kessl. Note by L. BERG, Izv. Obsh. Moskov. lxxxvi, ii, p. 14; *C. fundulus*, Pall., var. n. *toporovanica*, KAMENSKY, Trudui Kharkov Univ. xxxi, 1897, p. 83, pl. iii, figg. 3 & 4, Caucasus.
- Schizothorax kessleri*, Herz. Note by L. BERG, *t. c.* p. 15.
- Barbus lacerta*, Heck., var. n. *escherichi*, STEINDACHNER, Denkschr. Akad. Wien, lxiv, p. 688, pl. ii, fig. 1, Angora.
- Ptychobarbus conirostris*, Stdr., figured by ALCOCK, Rep. Nat. Hist. Res. Pamir Bound. Comm. pl. i, figg. 2 & 3.
- Plagopterus argentissimus*, Cope. Note by GILBERT & SCOFIELD, P. U. S. Mus. xx, p. 496.
- Meda fulgida*, Gir. Note by GILBERT & SCOFIELD, *t. c.* p. 497.
- Leuciscus bicolor*, Gir., redescribed and figured by GILBERT, Bull. U. S. Fish Comm. xvii, p. 7, fig.; *L. intermedius*, Gir. Note by GILBERT & SCOFIELD, P. U. S. Mus. xx, p. 493; *L. sinslawi*, sp. n., EVERMANN & MEEK, Bull. U. S. Fish Comm. xvii, p. 72, figg., Sinslaw R., Oregon.
- Squalius orientalis*, Heck., described by STEINDACHNER, Denkschr. Akad. Wien, lxiv, p. 691; *S. turcicus*, De Fil. Notes by KAMENSKY, Trudui Kharkov Univ. xxxi, 1897, pp. 85 & 97, pl. iv, fig. 5; var. n. *platycephala*, *id. ibid.* p. 85, figg. 6-8, Caucasus; *S. pinnomaculatus*, sp. n., KAMENSKY, Trudui Kharkov Univ. xxx, 1896, p. 131, pl. v, Russia, Gov. Kharkov; *S. transcaspensis*, sp. n., L. BERG, Izv. Obsh. Moskov. lxxxvi, ii, p. 16, Transcaspiia.
- Rutilus bicolor*, Gir., redescribed and figured by GILBERT, *t. c.* p. 8, fig.
- Gila elegans*, B. & G., and *robusta*, B. & G. Notes by GILBERT & SCOFIELD, P. U. S. Mus. xx, pp. 492 & 493.
- Tinca vulgaris*, Cuv. On secondary sexual characters: ANDRES, Rend. Ist. Lombard. (2) xxx, p. 1430, pls. vi-viii.
- Abramis elongatus*, Ag., var. *asianus*, Stdr., described and figured by STEINDACHNER, Denkschr. Akad. Wien, lxiv, p. 689, pl. iv, fig. 1.
- Notropis hudsonius*, Clint., redescribed and figured by EVERMANN & KENDALL, Bull. U. S. Fish Comm. xvii, p. 126, pl. vi, fig. 3; *N. welaka*, sp. n., *id. ibid.* p. 126, pl. vi, fig. 2, Florida; *N. chamberlaini* and *louisianae*, spp. nn., JORDAN & EVERMANN, Fish. N. Am. iii, pp. 2800 & 2801, Louisiana.
- Tiaroga cobitis*, Gir., described and figured by GILBERT & SCOFIELD, P. U. S. Mus. xx, p. 494, pl. xxxvii.
- Agosia oscula*, Gir., and *couesii*, Yarr. Notes by GILBERT & SCOFIELD, *t. c.* pp. 495 & 496; *A. klamathensis*, sp. n., EVERMANN & MEEK, Bull. U. S. Fish Comm. xvii, p. 74, fig., Klamath Lake, Oregon.
- Alburnus fasciatus*, Nordm. Notes by L. BERG, *t. c.* p. 18, and by KAMENSKY, *op. cit.* xxxi, p. 88. The latter also describes and figures a hybrid, *A. fasciatus* × *Squalius turcicus*, p. 90, pl. iii, fig. 1; *A. escherichii*, sp. n., STEINDACHNER, *t. c.* p. 692, pl. iv, fig. 3.
- Alburnoides bipunctatus*, Bl. Note by STEINDACHNER, *t. c.* p. 691.

- Rhodeus amarus*, Bl., represented in the act of ovipositing : CUÉNOT, Bull. Soc. zool. France, xxiii, p. 53, fig. Recorded from Dept. Allier, France : E. OLIVIER, Feuille Natural. xxix, p. 29.
- Opsariichthys bidens*, Gthr., figured by GÜNTHER, Ann. Nat. Hist. (7) i, pl. xiii, fig. B ; *O. morrisonii*, sp. n., *id. ibid.* p. 262, pl. xiii, fig. A, Newchwang, North China.
- Culter erythropterus*, Basil. Note by GÜNTHER, *t. c.* p. 262.
- Nemachilus angoræ*, sp. n., STEINDACHNER, Denkschr. Akad. Wien, lxiv, p. 693, pl. iv, fig. 4, Angora ; *N. cristatus*, sp. n., L. BERG, Izv. Obsh. Moskov. lxxxvi, ii, p. 19, fig. Transcaspia ; *N. yasinensis*, sp. n., ALCOCK, Rep. Nat. Hist. Res. Pamir Bound. Comm. p. 38, pl. ii, fig. 2.

CHARACINIDÆ.

- Curimatus guentheri*, sp. n., BOULENGER, Boll. Mus. Torino, xiii, No. 329, p. 4, Ecuador.
- Alestes liebrechtsii*, sp. n., BOULENGER, Ann. Mus. Congo, Zool. i, p. 29, pl. xv, Congo.
- Tetragonopterus branickii*, Stdr. = *T. brevirostris*, Gthr., BOULENGER, Boll. Mus. Torino, xiii, No. 329, p. 1 ; *T. festæ* and *simus*, spp. nn., *id. ibid.* p. 2, Ecuador.
- Brycon atricaudatus*, Kner (= *moorii*, Stdr.), and *striatulus*, Kner. Notes by BOULENGER, *t. c.* pp. 3 & 4.
- Hydrocyon goliath*, p. 23, pl. xi, and *vittatus*, p. 24, pl. x, fig. 2, spp. nn., BOULENGER, Ann. Mus. Congo, Zool. i, Congo.
- Distichodus maculatus*, p. 27, pl. xiii, fig. 1, *fasciolatus*, p. 28, pl. xiv, and *atroventralis*, p. 28, pl. xiii, fig. 2, spp. nn., BOULENGER, *l. c.*, Congo.
- Eugnathichthys*, g. n., intermediate between *Ichthyoborus*, Gthr., and *Phago*, Gthr., BOULENGER, *l. c.* p. 25 ; *E. eetveldii*, sp. n., *id. ibid.* p. 26, pl. xii, Congo.

CYPRINODONTIDÆ.

- Haplochilus tanganicanus*, sp. n., BOULENGER, Tr. Z. S. xv, p. 25, pl. vi, fig. 3, Lake Tanganyika.
- Characodon garmani*, sp. n., JORDAN & EVERMANN, Fish. N. Am. iii, p. 2831, Coahuila, Mexico.
- Pacilia occidentalis*, B. & G., redescribed by GILBERT & SCOFIELD, P. U. S. Mus. xx, p. 498 ; *P. festæ*, sp. n., BOULENGER, Boll. Mus. Torino, xiii, No. 329, p. 13, Ecuador.
- Platypacilus quitzeoensis*, sp. n., B. A. BEAN, P. U. S. Mus. xxi, p. 540, fig., Lake Quitzeo, Mexico.

HETEROPYGII.

- C. H. EIGENMANN, Rep. Brit. Ass. 1897, pp. 685 & 686, and P. Ind. Ac. 1897, p. 230, remarks on the blind Fishes of North America.
- Typhlichthys rosæ*, sp. n., EIGENMANN, P. Ind. Ac. 1897, p. 231, Missouri caves.

SCOMBRESOCIDÆ.

- Belone tenuis*, Kramb. (foss.), redescribed and figured by GORJANOVIC-KRAMBERGER, Glasnik Naravosl. Drust. x, p. 26, pl. ii, fig. 1.

ESOCIDÆ.

E. E. PRINCE, Rep. Brit. Ass. 1897, p. 688, remarks on the species of *Esox* found in North America.

GALAXIIDÆ.

Galaxias alpinus, Jen., described and figured by SMITT, Bih. Svenska Ak. xxiv, iv, No. 5, p. 56, pl. v, fig. 40; *G. platei*, sp. n., STEINDACHNER, Zool. Jahrb., Suppl. iv, p. 329, pl. xx, fig. 13, Magellan Straits.

MORMYRIDÆ.

J. OGNEFF, Zeitschr. Wiss. Zool. lxiv, pp. 565-595, pl. xviii, records his observations of the structure of the electric organ of the Mormyrs.

Synopsis of the genera: BOULENGER, Ann. Mus. Congo, Zool. i, p. 2.

Mormyrops, J. Müll. Synopsis of the species: BOULENGER, *l. c.* p. 3; *M. engystoma*, p. 3, pl. i, fig. 1, *masuianus*, p. 4, pl. ii, fig. 1, *sirenoides*, p. 4, pl. i, fig. 2, *lineolatus*, p. 5, pl. ii, fig. 2, *microstoma*, p. 6, pl. i, fig. 3, and *attenuatus*, p. 6, pl. i, fig. 4, spp. nn., *id. ibid.*, Congo.

Marcusenius, Gill. Synopsis of the species: BOULENGER, *l. c.* p. 7; *M. plagiostoma*, p. 7, pl. iii, fig. 1, and *wilverthi*, p. 8, pl. iv, fig. 1, spp. nn., *id. ibid.*, Congo; *M. petherici*, sp. n., *id. ibid.*, p. 7, Nile.

Stomatorhinus, g. n., for *Mormyrus walkeri*, Gthr., and *S. microps*, sp. n., BOULENGER, *l. c.* p. 9, pl. iv, fig. 2, Congo.

Myomyrus, g. n., for *M. macrodon*, sp. n., BOULENGER, *l. c.* p. 10, pl. vii, fig. 1, Congo.

Gnathonemus, Gill. Synopsis of the species: BOULENGER, *l. c.* p. 10; *G. mirus*, p. 11, pl. iii, fig. 2, *elephas*, p. 12, pl. v, fig. 1, *rhynchophorus*, p. 12, pl. v, fig. 2, *curvirostris*, p. 13, pl. vi, fig. 1, and *numenius*, p. 14, pl. vi, fig. 2, spp. nn., *id. ibid.*, Congo.

Mormyrus, L. Synopsis of the species: BOULENGER, *l. c.* p. 14; *M. ovis*, p. 15, pl. vii, fig. 2, *caballus*, p. 16, pl. viii, fig. 1, and *proboscirostris*, p. 16, pl. viii, fig. 2, spp. nn., *id. ibid.*, Congo.

Genyomyrus, g. n., for *G. donnyi*, sp. n., BOULENGER, *l. c.* p. 17, pl. ix, Congo.

STERNOPTYCHIDÆ.

Diplophos corythæolum, sp. n., ALCOCK, Ann. Nat. Hist. (7) ii, p. 147, Andaman Sea, 185 & 405 faths.

STOMIATIDÆ.

Thaumatostomias atrox, Alcock. Note by ALCOCK, Ann. Nat. Hist. (7) ii, p. 147.

SALMONIDÆ.

W. L. CALDERWOOD, P. R. Soc. Edinb. xxii, pp. 47-55, writes on the migratory movements of the British Salmonoids during the spawning season.

Salmo salar, L. A. E. GATHORNE HARDY, The Salmon (London, 1898, 8vo). N. PATON reports on the life-history of the Salmon in fresh water (Edinburgh, 1898, 8vo). G. L. GULLAND, Anat. Anz. xiv, pp. 441-455, figg., investigates the minute structure of the digestive tract

- of the Salmon, and the changes which occur in it in fresh water. A. BROWN, Zool. Anz. xxi, pp. 514 & 515, 517-523, investigates the gut of the Salmon, with a view to ascertaining whether Salmon feed in fresh water; *S. hearnii*, Rich. On specimens from Hudson Bay: PRINCE, Rep. Brit. Ass. 1897, p. 687; *S. kilimensis*, Gthr. Note by TRAQUAIR, Ann. Scott. Nat. Hist. 1898, p. 78; *S. clarkii tahoensis*, subsp. n., JORDAN & EVERMANN, Fish. N. Am. iii, p. 2870, Lake Tahoe.
- Oncorhynchus keta*, Walb., *tschawytscha*, Walb., *kisuch*, Walb., and *nerka*, Walb. Biological notes by EVERMANN & MEEK, Bull. U. S. Fish Comm. xvii, pp. 77-79.
- Phylogephyra*, g. n., connecting *Thymallus* with *Salmo*; *P. altaica*, sp. n., BOULENGER, Ann. Nat. Hist. (7) i, p. 330, fig., Altai Mts.
- Coregonus schinzii helveticus*, Fatio, recorded from Tessin by PAVESI, Rend. Ist. Lombard. (2) xxxi, p. 229.
- Argentina silus*, Nilss. On a specimen from off the coast of Ireland: HOLT, J. Mar. Biol. Ass. (2) v. p. 341.
- Osmerus albatrossis*, sp. n., JORDAN & EVERMANN, Fish. N. Am. iii, p. 2823, Alaska.
- Bathylagus milleri*, sp. n., JORDAN & EVERMANN, *t. c.* p. 2825, off S. Diego, California, 776 faths.
- Argyrosomus alascanus*, sp. n. (SCOFIELD), JORDAN & EVERMANN, *t. c.* p. 2817, N. Alaska.

GONORHYNCHIDÆ.

- Spaniodon hakelensis*, J. W. Davis (foss.), referred to *Charitosomus*, Marck, A. S. WOODWARD, Ann. Nat. Hist. (7) ii, p. 412.

CLUPEIDÆ.

- Clupea harengus*, L. Part I of HEINCKE'S 'Naturgeschichte des Herings,' Abh. Deutsch. Seefischer. Ver. ii, deals with the local forms and migrations. Remarks on the life history: H. F. MOORE, Rep. U. S. Fish Comm. f. 1896, p. 387. On specimens living and breeding in a pond adjacent to the estuary of the Humber: H. M. FOSTER, Tr. Hull Club, i, p. 9; *C. fuegensis*, Jen., and *arcuata*, Jen., described and figured by SMITT, Bih. Svenska Ak. xxiv, iv, No. 5, pp. 59 & 62, pl. v, figg. 41 & 42.
- Alosa sapidissima*, Wils. On its distribution on the Pacific Coast of N. America: EVERMANN & MEEK, Bull. U. S. Fish Comm. xvii, p. 76; *A. alabamæ*, Jord. & Everm. Note and figures by EVERMANN & KENDALL, Bull. U. S. Fish Comm. xvii, p. 127, pl. vii, figg. 5 & 6.
- Signalosa*, g. n., allied to *Alosa* and *Dorosoma*, for *S. atchafalayæ*, sp. n., EVERMANN & KENDALL, *t. c.* p. 127, pl. vii, fig. 4, Louisiana.
- Harengula stereolepis*, sp. n., DOUGLAS OGILBY, P. Linn. Soc. N. S. Wales, xxii, p. 759, Torres Straits.
- Stolephorus rostralis*, *mundeolus*, *naso*, and *starksii*, spp. nn. (GILBERT & PIERSON), JORDAN & EVERMANN, Fish. N. Am. iii, pp. 2811-2813, Panama.
- Cetengraulis engymer*, sp. n. (GILBERT & PIERSON), JORDAN & EVERMANN, *t. c.* p. 2815, Panama; *C. juruensis*, sp. n., BOULENGER, Tr. Z. S. xiv, p. 427, pl. xli, fig. 3, R. Jurua, Brazil.
- Thrissopteroides tenuiceps*, n. n. for *Clupea elongata*, J. W. Davis (foss.), A. S. WOODWARD, Ann. Nat. Hist. (7) ii, p. 408.
- Clupea curta* and *attenuata*, J. W. Davis (foss.), referred to *Osmeroides* by A. S. WOODWARD, *t. c.* p. 409.

- Engraulis* (?) *tenuis*, J. W. Davis (foss.). Notes by A. S. WOODWARD, *t. c.* p. 410.
Pachyrhizodus leptognathus & *velox*, spp. nn. (foss.), A. STEWART, Kansas Quart. vii, p. 193, pl. xvii, Kansas Cretaceous.
Elops congicus, sp. n., BOULENGER, Ann. Mus. Congo, Zool. i, p. 21, pl. x, fig. 1, Lower Congo.

SAURODONTIDÆ.

- Remarks on the genera (all fossil): A. STEWART, Kansas Quart. vii, pp. 21 & 177.
Portheus, Cope (*Xiphactinus*, Leidy). Observations by O. P. HAY, Zool. Bull. ii, p. 25, figg., who refers the genus to the *Elopidae*.
Portheus lowii, sp. n., A. STEWART, *t. c.* p. 24, pl. ii, fig. 2, Kansas Cretaceous.
Daptinus broadheadi, sp. n., A. STEWART, *t. c.* p. 24, pl. ii, fig. 1, Kansas Cretaceous.
Saurocephalus dentatus, sp. n., A. STEWART, *t. c.* p. 25, pl. i, figg. 3 & 4, Kansas Cretaceous.
Saurodon xiphrostris & *ferox*, spp. nn., A. STEWART, *t. c.* pp. 178 & 183, pls. xiv-xvi, Kansas Cretaceous.
Ichthyodectes hamatus, Cope. Note by O. P. HAY, Amer. J. Sci. (4) vi, p. 225; *I. cruentus*, sp. n. (foss.), *id. ibid.*, fig., Cretaceous, W. Kansas.
Gillicus, g. n., for *Ichthyodectes polymicrodus*, Crook, O. P. HAY, *t. c.* p. 230.

ALEPOCEPHALIDÆ.

- Alepocephalus agassizii*, Goode & Bean. Note by LÜTKEN, Ichth. Ingolf Exped. p. 8.
Xenodermichthys squamilaterus, sp. n., ALCOCK, Ann. Nat. Hist. (7) ii, p. 148, Andaman Sea, 370-419 faths.

HALOSAURIDÆ.

- Halosaurichthys nigerrimus*, sp. n., ALCOCK, Ann. Nat. Hist. (7) ii, p. 149, off Maldives, 459 faths.

DERCETIDÆ.

- Dercetis*, sp. (foss.). Figure of a specimen from the Chalk of Mt Lebanon: A. S. WOODWARD, Nat. Sci. xii, pl. x.

GYMNOTIDÆ.

- Sternarchus tamandua*, sp. n., BOULENGER, Tr. Zool. Soc. London, xiv, p. 427, pl. xlii, R. Jurua, Brazil.
Steatogenys, g. n., for *Rhamphichthys elegans*, Stdr., BOULENGER, *t. c.* p. 428.

MURÆNIDÆ.

- Conger vulgaris*, Cuv. On the scarcity of male specimens: FACCIOLOÀ, Natural. Sicil. (2) ii, p. 174.
Anguilla, Cuv. On specimens from New Caledonia: DOUGLAS-OGILBY, P. Linn. Soc. N. S. Wales, xxii, p. 765; *A. vulgaris*, Turt. On varia-

- tions in the proportions in Japanese specimens: ISHIKAWA, Annot. zool. Japon. ii, p. 125. On a large specimen extracted from the stomach of a Sperm-whale: VAILLANT, C.R. Ac. Sci. cxxvi, p. 1429.
- Congromuræna*, Kaup. Remarks by DOUGLAS-OGILBY, P. Linn. Soc. N. S. Wales, xxiii, p. 284.
- Congrellus*, g. n., for *Muræna balearica*, De la Roche, and allies, DOUGLAS-OGILBY, t. c. p. 286; *C. gilberti*, p. 288, Bay of Panama, and *fijiensis*, p. 290, Fiji, spp. nn., *id. ibid.*
- Bathycongrus*, g. n., for *Congromuræna nasica*, Alcock, and allies, DOUGLAS-OGILBY, t. c. p. 292.
- Pisoodonophis daspilotus*, sp. n. (GILBERT), JORDAN & EVERMANN, Fish. N. Am. iii, p. 2803, Panama.
- Muræna clepsydra*, sp. n. (GILBERT), JORDAN & EVERMANN, t. c. p. 2805, Panama.
- Nettenchelys*, g. n., closely related to *Nettastoma* and *Saurenychelys*, ALCOCK, Ann. Nat. Hist. (7) ii, p. 149; *N. taylori*, sp. n., *id. ibid.* p. 150, off Travancore coast, 430 faths.
- Synaphobranchus pinnatus*, Johns. Note by ALCOCK, t. c. p. 151.
- Nemichthys beanii*, Gill & Ryder. Note by LÜTKEN, Ichth. Ingolf Exped. p. 7.
- Leptocephalus oculus*, Ptrs., figured by JATZOW & LENZ, Abh. Senckenb. Ges. xxi, pl. xxxvi, fig. 18.

INCERTÆ SEDIS.

- Creedia*, g. n., DOUGLAS-OGILBY, P. Linn. Soc. N. S. Wales, xxiii, p. 298; *C. clathrisquamis*, sp. n., *id. ibid.* p. 299, Marvubra Beach, near Sydney.

LOPHOBRANCHII.

- Syngnathus rostellatus*, Nilss. On its variations: G. DUNCKER, J. Mar. Biol. Ass. (2) v, p. 175.
- Corythoichthys cayorum*, sp. n., EVERMANN & KENDALL, Bull. U. S. Fish Comm. xvii, p. 128, pl. vii, fig. 7, Florida.
- Siphostoma sinaloæ*, sp. n., JORDAN & EVERMANN, Fish. N. Am. iii, p. 2838, Mazatlan, Mexico.

PLECTOGNATHI.

- Cantherines carolæ*, sp. n., JORDAN & EVERMANN, Fish. N. Am. ii, p. 1713, Islands off W. Coast of Mexico.
- Spheroides maculatus*, Bl. Schn., and *testudineus*, L. Notes by EVERMANN & B. A. BEAN, Rep. U. S. Fish Comm. f. 1896, pp. 246 & 247.
- Lyosphaera*, g. n., allied to *Chilomycterus*, for *L. globosa*, sp. n., EVERMANN & KENDALL, Bull. U. S. Fish Comm. xvii, p. 131, pl. ix, figg. 11 & 12, Virginia.
- Orthagoriscus*, Bl. Schn. The genus monographed by STEENSTRUP & LÜTKEN, Vid. Selsk. Skr. (6) ix, No. 1, 102 pp., figg., 4 pls.; *O. mola*, L. Notes on a specimen captured near Scarborough: W. G. CLARKE, Zoologist, lvi, p. 439.

GANOIDEI.

- O. P. HAY, Amer. Nat. xxxii, pp. 341-349, figg., remarks on the structure of the vertebral column of Amioid and Lepidosteoid Fishes, with suggestions as to their position in the system.

The general conclusions of E. P. ALLIS's memoir on the cranial muscles and cranial and first spinal nerves of *Amia calva*, are translated into French by F. MUNCH, Arch. zool. exp. (3) vi, pp. 63-90, figg.

J. B. JOHNSTON, Anat. Anz. xiv, pp. 580-602, figg., has a paper on the hind brain and cranial nerves of *Acipenser*.

Petalopteryx syriacus, Pict. (foss.). Note on the type specimen: A. S. WOODWARD, Ann. Nat. Hist. (7) ii, p. 485.

Protosphyraena bentonia and *recurvirostris*, spp. nn. (foss.), A. STEWART, Kansas Quart. vii, pp. 27, 191, pl. i, fig. 2, Kansas Cretaceous.

Coccodus armatus, Pict. (foss.). Note on the type specimen: A. S. WOODWARD, Ann. Nat. Hist. (7) ii, p. 486.

Cœlodus attenuatus, sp. n. (foss.), PRIEM, Bull. Soc. geol. France (3) xxvi, p. 230, pl. ii, fig. 1, Upper Cretaceous, Paris Basin.

Anomœodus subclavatus, Ag. (foss.). Teeth described and figured by PRIEM, t. c. p. 233, pl. ii, figg. 3 & 4.

Palæobalistum ponsorti, Heck. (foss.), described and figured by PRIEM, t. c. p. 401, pl. xi, fig. 2.

Lepidotus semiserratus, Ag. (foss.). Remains from the Upper Lias of Whitby, described and figured by A. S. WOODWARD, P. Yorksh. Geol. Soc. (2) xiii, p. 325, pls. xli-xlviii.

Acipenser sturio, L. On a specimen from Hudson Bay: PRINCE, Rep. Brit. Ass. 1897, p. 687. *A. ruthenus*, L. On a specimen with anomalous snout: JAQUET, Bull. Soc. Bucharest, vii, p. 504, fig.; *A. stenorrhynchus*, sp. n., NIKOLSKY, in DERZUGHIN & DEZHEVETZKIC, Bull. Lab. St. Petersb. ii, p. 42, Obi R.

CROSSOPTERYGII.

T. GILL, Rep. Brit. Ass. 1897, p. 697, remarks on the pectoral limb of *Polypterus*, from which the chiropterygium may have been derived.

W. WINSLOW, Tufts Coll. Stud. No. 5, pp. 182-188, pl. iv, figg. 27-29, describes and figures the chondrocranium of *Polypterus bichir*.

Polypterus, Geoffr. Synopsis of the species: BOULENGER, Ann. Nat. Hist. (7) ii, p. 416; *P. congicus* and *weeksii*, spp. nn., *id. ibid.* pp. 418 & 419, Congo. On specimens with external gills: *id.* P. Z. S. 1898, p. 493.

Holoptychius kayseri, Koenen (foss.), is referred to *Cœlacanthus* by A. S. WOODWARD, Geol. Mag. (iv) v, p. 529, fig.

Protodus scoticus, E. T. Newton (foss.). Note by TRAQUAIR, Ann. Nat. Hist. (7) ii, p. 68, pl. i, fig. 3.

Sauripterus crassidens, n. sp., for a tooth from the Old Red Sandstone of Alves, Scotland: TRAQUAIR, P. Phys. Soc. Edinb. xiii, p. 383, pl. xi, fig. 7.

Holoptychius decoratus, Eichw. Scale described and figured by TRAQUAIR, P. Phys. Soc. Edinb. xiii, p. 382, pl. xi, fig. 6.

Dendrodus arisaigensis, n. sp. (foss.) for a tooth from the Silurian Upper Arisaig series of Nova Scotia: WHITEAVES, Rep. Brit. Ass. 1897, p. 656.

DIPNOI.

T. W. BRIDGE, Tr. Zool. Soc. xiv, pp. 325-376, pls. xxviii & xxix, deals with the morphology of the skull of *Lepidosiren* and other Dipnoi.

W. WINSLOW, Tufts Coll. Stud. No. 5, pp. 188-193, pl. iv, figg. 30-32, describes and figures the chondrocranium of *Protopterus annectens*.

R. SEMON, Denkschr. Ges. Jena, iv, ii, pp. 59-111, figg., pls. xi-xvii, investigates the development of the paired fins of *Ceratodus forsteri*.

B. SPENCER, Denkschr. Ges. Jena, iv, ii, pp. 51-58, figg., pls. ix & x, writes on the structure of the lungs of *Ceratodus* and *Protopterus*.

- M. P. BRIQUEL, Bibliog. Anat. vi, pp. 11-16, figg., has remarks on the teeth of *Ceratodus*.
- J. V. ROHON, Sitzungsber. Bohm. Ges. 1898, No. xi, 18 pp., 1 pl., investigates the structure of the Upper Silurian Dipnoan teeth.
- Ceratodus forsteri*, Krefft. On the transport of living specimens from Queensland to England: D. O'CONNOR, P. Z. S. 1898, p. 493; *C. robustus* and *americanus*, spp. nn. (foss.), W. C. KNIGHT, Amer. J. Sci. (4) v, p. 186, figg., Jurassic of Wyoming.
- Lepidosiren paradoxa*, Fitz. On the habits and development: J. GRAHAM KERR, P. Z. S. 1897, p. 921, & 1898, p. 492. On the dry-season habits: R. J. HUNT, P. Z. S. 1898, p. 41, figg. On specimens from the Amazon: GOELDI, Tr. Z. S. xiv, p. 413, pls. xxxvii & xxxviii.

ARTHRODIRA.

- C. R. EASTMAN, Bull. Mus. Harvard, xxxi, 1897, pp. 19-32, and Amer. Nat. xxxii, pp. 747-768, figg., has contributions to the knowledge of *Dinichthys* & *Titanichthys*.
- W. CLARK, Rep. Ohio Labor. vi, pp. 46-48, figg., remarks on some new points on the fin-attachment of *Dinichthys* and *Cladodus*.
- Dinichthys livonicus*, *trautscholdi*, *pelmensis*, and *pustulosus*, spp. nn., EASTMAN, Bull. Mus. Harv. xxxi, pp. 34-38, Devonian of Europe and North America.
- Coccosteus magnus*, Traq. Dorsal plate described and figured by TRAQUAIR, P. Phys. Soc. Edinb. xiii, 1897, p. 378, pl. x, fig. 1.

HOLOCEPHALA.

- Chimæra ogilbyi*, sp. n., WAITE, Rep. Fish. 'Thetis,' p. 41, pl. xi, New South Wales.
- Callorhynchus antarcticus*, var. *peronii*, A. Dum., described and figured by SMITT, Bih. Svenska Ak. xxiv, iv, No. 5, p. 66, pl. vi.
- C. R. EASTMAN, Amer. Nat. xxxii, pp. 473-488, 545-550, figg., writes on the dentition of the Devonian *Ptyctodontidæ*.
- Ptyctodus compressus*, p. 479, figg., Devonian of Iowa, *ferox*, p. 480, figg., Devonian, Wisconsin, and *panderi*, p. 484, figg., Devonian of the Eifel District, Germany, spp. nn. (foss.), EASTMAN, Amer. Nat. xxxii.
- Rhynchodus rostratus* and *major*, spp. nn. (foss.), EASTMAN, t. c. p. 487, figg., Eifel Devonian.
- Palæomylus prædator*, sp. n. (foss.), EASTMAN, t. c. p. 549, fig., Eifel Devonian.
- Belemnacanthus giganteus*, g. & sp. n. (foss.), for a spine from the Eifel Devonian, EASTMAN, t. c. p. 552, fig.

ELASMOBRANCHII.

- A. SABATIER, C.R. Ac. Sci. cxxvii, pp. 928-932, has considerations on the morphology of the girdles and fins of Selachians.
- H. BRAUS, Verh. Anat. Ges. xii, pp. 166-179, figg., has observations on the development of the hind limbs of *Spinax niger*.
- H. VIRCHOW, Verh. Anat. Ges. xii, pp. 43-49, figg., remarks on the early development of Selachians.
- F. KOPSCH, Verh. Anat. Ges. xii, pp. 58-67, 70-73, figg., has observations on the early development of *Scyllium*.
- A. N. SEVERTZOFF, Bull. Soc. Moscou, 1898, pp. 197-263, 4 pls., has a

- memoir on the metamery of the head of *Torpedo*. Preliminary note : Anat. Anz. xiv, pp. 271-282.
- G. CHIARUGI, Monit. Zool. Ital. ix, pp. 37-56, figg., writes on an epithelial organ connected with the hypophysis and on the development of the hypophysial region in embryos of *Torpedo ocellata*.
- J. W. VAN WIJHE, Verh. Anat. Ges. xii, pp. 31-36, figg., has remarks on the formation of the pronephrotic duct in Selachians.
- A. H. SCHMIDT, Tijdschr. Nederl. Dierk. (2) vi, pp. 1-108, pls. i-iii, investigates the ovarium of Selachians.
- W. G. RIDEWOOD, J. Anat. Physiol. norm. path. (2) xiii, pp. 228-242, figg., investigates the eyelid-muscles of the *Carchariidæ* and *Scyllium*.
- F. E. JUNGENSEN, Anat. Anz. xiv, pp. 498-513, figg., writes on the claspers or copulatory organs of Selachians.
- C. S. TOMES, Phil. Tr. exc, pp. 443-464, pls. xvii & xviii, investigates the structure and development of the enamel of Elasmobranch Fishes. Abstract, P. R. Soc. London, lxiii, pp. 54-56.
- A. KOHN, Arch. mikr. Anat. liii, pp. 281-312, pl. xv, writes on the suprarenal and interrenal bodies of Selachians.
- E. YUNG, C.R. Ac. Sci. cxxvii, pp. 77 & 78, writes on the functions of the pancreas in the Selachians.
- H. NEUVILLE, Bull. Mus. Paris, 1898, p. 201, writes on the terms under which the various forms of the spleen have been designated in Selachians.
- H. VIRCHOW, SB. Ges. naturf. Berlin, 1898, pp. 118-135, writes on the development of the circulatory system in *Torpedo ocellata*.
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- R. BURCKHARDT, Arch. Sci. Nat. (4) vi, pp. 621 & 622, remarks on the external form of the brain of Selachians.
- H. V. NEAL, Bull. Mus. Harvard, xxxi, pp. 147-294, figg., 9 pls., describes the segmentation of the nervous system in *Acanthias*, as a contribution to the morphology of the Vertebrate head.
- W. SZEZAWINSKA, Arch. Biol. xv, pp. 463-509, pls. xxi & xxii, investigates the nerve-cells of Selachians.
- G. RETZIUS, Biol. Unters. (2) viii, pp. 75-82, pl. xviii, writes on the Lorenzian ampullæ in the nerve-terminations in Selachians, and pp. 83-93, pls. xix-xxi, on the nerve-terminations in the electric organ of *Raia*.
- F. CREVATIN, Anat. Anz. xiv, pp. 243-250, figg., remarks on some points in the histological structure of the electric organ of *Torpedo*.
- O. JAEKEL, SB. Ges. naturf. Berlin, 1898, pp. 44-53, proposes a new classification of the Rays, recent and fossil, embracing the following five families: *Petalodontidæ*, *Psammodontidæ*, *Centrobatidæ*, *Squatulinidæ*, *Rhinorajidæ*.
- Carcharhinus caudalis* and *velox*, spp. nn. (GILBERT), JORDAN & EVERMANN, Fish. N. Am. iii, pp. 2746 & 2747, Panama.
- Scoliodon rhenanus*, sp. n. (foss.), JAEKEL, SB. Ges. naturf. Berlin, 1898, p. 165, Mayence Oligocene.
- Hypoprion rhenanus*, sp. n. (foss.), JAEKEL, p. 166, Mayence Oligocene.
- Galeocerdo contortus*, Gibb., var. n. *hassia* (foss.), JAEKEL, t. c. 1898, p. 165, Mayence Oligocene.
- Galeus müllerei*, sp. n. (foss.), JAEKEL, t. c. p. 164, Mayence Oligocene.
- Mitsukurina*, g. n., type of a distinct family *Mitsukurinidæ*, allied to the *Carchariidæ*, JORDAN, P. Calif. Ac. (3) i, p. 199; *M. owstoni*, sp. n., *id. ibid.* p. 200, pls. xi & xii, Japan.
- Corax pristodontus*, Ag., var. n. *plicatus* (foss.), PRIEM, Bull. Soc. geol. France (3) xxvi, p. 236, pl. ii, fig. 5, Upper Cretaceous, Paris Basin.
- Scyllium andreai*, sp. n. (foss.), JAEKEL, t. c. p. 163, Mayence Oligocene.

- Hybodus*, Ag. (foss.). Remarks by JAEKEL, *t. c.* p. 135 ; *H. grossicornis*, Ag. On a tooth from the Inferior Oolite of Haresfield Beacon, Gloucestershire : T. BEACALL, *Nature*, lviii, p. 390.
- Orthybodus*, g. n. for *Hybodus grossiconus*, Ag. (foss.), JAEKEL, *t. c.* p. 138.
- Parhybodus*, g. n. for *Hybodus longiconus*, Ag. (foss.), JAEKEL, *t. c.* p. 143.
- Chlamydoselachus anguineus*, Garm. On the embryo : NISHIKAWA, *Ann. Zool. Japon.* ii, p. 95, figg., pl. iv.
- Læmargus brevipinnis*, M. & H. Note on the anatomy : SICHER, *Atti Acc. Gioen.* (4) xi, No. 5, p. 57.
- Centrophorus rossi*, sp. n., ALCOCK, *Ann. Nat. Hist.* (7) ii, p. 143, off Travancore Coast, 430 faths.
- Squatina acanthoderma*, Fraas (foss.). Note on and figure of a new specimen : A. S. WOODWARD, *Geol. Mag.* (iv) v, p. 289, pl. x.
- Raia alba*, Lacép. On its egg-purse : HOLT, *J. Mar. Biol. Ass.* (2) v, p. 181 ; *R. hyperborea*, Coll. : notes by LÜTKEN, *Ichth. Ingolf Exped.* p. 2 ; *R. fyllæ*, Lütken, figured by LÜTKEN, *t. c.* pl. ii ; *R. ingolfiana*, sp. n., *id. ibid.* p. 3, pl. i, off Holstenborg, Greenland ; *R. powelli*, sp. n., ALCOCK, *Ann. Nat. Hist.* (7) ii, p. 145, Gulf of Martaban, 67 faths. ; *R. chilensis*, sp. n., STEINDACHNER, *Zool. Jahrb., Suppl.* iv, p. 332, pl. xxi, fig. 15, Chili.
- Torpedo suessii*, sp. n., STEINDACHNER, *SB. Ak. Wien*, cvii, i, p. 784, pl. ii, Red Sea.
- Discopyge tschudii*, Heck., figured by STEINDACHNER, *Zool. Jahrb., Suppl.* iv, pl. xxi, fig. 14.
- Benthobatis*, g. n., allied to *Narcine* and *Discopyge*, ALCOCK, *Ann. Nat. Hist.* (7) ii, p. 144 ; *B. moresbyi*, sp. n., *id. ibid.* p. 145, off Travancore Coast, 430 faths.
- Lagarodus*, g. n. for *Psammodus specularis*, Roman. (foss.), JAEKEL, *SB. Ges. naturf. Berlin*, 1898, p. 50.
- Myliobatis asperimus*, sp. n. (GILBERT), JORDAN & EVERMANN, *Fish. N. Am.* iii, p. 2754, Panama.
- Cephaloptera*, sp. On the habits of a fish of this genus in the Gulf of California : VAILLANT & DIGNET, *Bull. Mus. Paris*, 1898, p. 127.
- Dendrodus arisaigensis*, sp. n., for a tooth from the Silurian, Upper Arisaig series, of Nova Scotia : WHITEAVES, *Canad. Rec.* vii, p. 461, fig.
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INCERTÆ SEDIS.

- Farnellia tuberculata*, g. & sp. nn., for vertebræ and scutes of obscure affinities from the Devonian of Scotland, TRAQUAIR, *Ann. Nat. Hist.* (7) ii, p. 69, pl. i, fig. 4.

CYCLOSTOMI.

- F. K. STUDNICKA, Anat. Anz. xiv, pp. 283-288, and Arch. mikr. Anat. li, pp. 452-460, writes on the histological structure of cartilage in *Petromyzon*.
- W. H. GASKELL, J. Anat. Physiol. norm. path. (2) xiii, pp. 154-188, figg., pl. iii, discusses the origin of the branchial segmentation of *Ammocætes*.
- L. DERVIEUX, Boll. Mus. Torin. xiii, No. 320, investigates the structure of the liver in *Petromyzon branchialis* perfect and larval.
- R. H. BURNE, J. Linn. Soc. xxvi, pp. 487-495, pl. xxxii, writes on the 'Porus genitalis' of the *Myxini*æ.
- M. ASCOLI, Atti Acc. Torin. xxxiii, pp. 916-923, pl., writes on the blood-corpusecles of *Petromyzon*.
- F. K. STUDNICKA, Sitzungsber. Bohm. Ges. 1898, No. xxi, disputes the supposed existence of a parietal eye in *Myxine glutinosa*.
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- E. COUVREUR, Ann. Soc. Linn. Lyon, xlv, pp. 105-109, figg., investigates the mechanism of respiration in Cyclostomes.
- BASHFORD DEAN has further remarks on the affinities of *Palæospondylus gunni*, Traq. (foss.), in reply to Traquair's criticisms of his former paper on the subject, P. Z. S. 1898, pp. 343-347.
- Petromyzon marinus*, L. and *wilderi*, Gage. On their habits: H. A. SURFACE, Bull. U. S. Fish Comm. xvii, p. 209, pls. x & xi.
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- H. KLAATSCH, Verh. Anat. Ges. xii, pp. 184-195, remarks on the tentacular apparatus of the mouth of the *Amphioxus*.
- R. HESSE, Zeitschr. Wiss. Zool. lxiii, pp. 456-464, pl. xxiv, writes on the organs of vision in the *Amphioxus*.
- E. BALLOWITZ, Anat. Anz. xiv, pp. 405-407, has a note on the histological structure of the epidermis in *Amphioxus*-larvæ.
- E. W. MACBRIDE, Quart. J. Micr. Sc. xl, pp. 589-612, pls. xliii-xlv, has a paper on the early development of the *Amphioxus*. Remarks by E. RAY LANKESTER, t. c. pp. 647-650.
- P. SAMASSA, Arch. Entwickmech. vii, pp. 1-33, figg., pls. i-iii, has a paper on the influence of the yolk on the gastrulation in the *Amphioxus*.
- R. LEGROS, Arch. anat. micr. i, pp. 508-542, and ii, pp. 1-43, pls. i & ii, writes on the development of the buccal cavity in *Branchiostoma lanceolatum*.
- J. A. HAMMAR, Anat. Anz., xiv, pp. 602-607, figg., writes on the development of the liver in the *Amphioxus*.
- H. KLAATSCH, Sitzb. Akad. Berlin, 1898, pp. 800-806, figg., writes on intercellular structures in the blastula of *Amphioxus*.
- T. GARBOWSKI, Anat. Anz. xiv, pp. 472-497, figg., discusses the bearing of *Amphioxus* to the mesoderm-theory.
- G. RETZIUS, Biol. Unters. (2) viii, pp. 118-122, pl. xxxi, has remarks on the nervous system of the *Amphioxus*.
- W. KRAUSE, Anat. Anz. xiv, pp. 470 & 471, remarks on the impression made by light on the spinal cord of the *Amphioxus*. Reply by R. HESSE, t. c. pp. 556 & 557.

VI. TUNICATA.

BY

PROFESSOR W. A. HERDMAN, D.Sc., F.R.S.

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INTRODUCTION.

IN addition to SEELIGER's continuation of his admirable Memoir on the Tunicata in "Bronn," the chief work of the year has certainly been systematic, especially speciographic. Large numbers of new forms have been described by SLUITER, RITTER, PIZON and HERDMAN. DELAGE & HÉROUARD's volume of their "Zoologie Concrète" which deals with the Protochorda contains an interesting and useful account of the Tunicata.

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10. GOTTSCHALDT, R. Synascidien von Ternate. Abh. Senckenb. Ges. xxiv, Hft. 4, pp. 641–660.
11. GIARD, A. Sur l'homologie des Thyroïdes latérales (corps post-branchiaux, Verdun) avec l'épicarde des Tuniciers. C.R. Soc. Biol. v, no. 15, pp. 464–466.
12. HERDMAN, W. A. Note on the Tunicate Fauna of Australian Seas. Ann. Nat. Hist. (7), i, pp. 443–450.
13. ——. Descriptions of some simple Ascidians collected in Puget Sound, Pacific Coast. Tr. Liverp. Biol. Soc. vol. xii, pp. 248–267, pls.
14. HUNTER, G. W. Notes on the peripheral nervous system of *Molgula manhattensis*. Science, 1898, p. 322, and J. Compar. Neurology, vol. viii, pp. 202–206, 1898.
15. LEFEVRE, G. Budding in *Perophora*. J. Morphol. xiv, pp. 367–424.
16. KOROTNEFF, A. Noch etwas über *Anchinia*. Mt. Stat. Neapel, Bd. xiii, pp. 426–432, pl. xii.
17. METCALF, M. M. The neural gland in *Cynthia papillosa*. Anat. Anz. 14 Bd. pp. 467–470.
18. ——. Note on Ascidian anatomy. Science, 1898, p. 202.
19. MICHAELSEN, W. Vorläufige Mittheilung über einige Tunicaten aus dem Magalhaensischen Gebiet, sowie von Süd-Georgien. Zool. Anz. 1898, no. 560, pp. 363–371.
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23. —. Étude anatomique et systématique des Molgulidées appartenant aux collections du Muséum de Paris. Ann. Sci. Nat. vii, pp. 305-391.
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II. BIOLOGY.

A. ANATOMY.

BANCROFT discusses fully the anatomy of *Chelyosoma* and sums up in favour of a close affinity with *Corella*.

HUNTER has found in *Molgula manhattensis* and in *Cynthia partita* that the endostyle contains many sensory bipolar cells. They are situated amongst the fusiform ciliated cells on the lateral wall of the groove. He has also found nerve endings in some of the ciliated cells of the peripharyngeal bands and of the branchial sac. The sensory nature of the tentacles has been demonstrated, and that of the dorsal tubercle affirmed by Herdman in 1884 has now been confirmed. Muscle endings have been found in the body musculature and sensory papillæ in the ectoderm.

RITTER confirms the impression that there is a distinct Arctic Tunicate fauna. He resuscitates MacLeay's genus *Dendrodoa* and describes a new species. He also re-examines Savigny's *Synoicum*, and gives a brief account of its hibernation, degeneration, and reproduction from ova, embryos and tailed larvæ found developing in cavities in the test after the complete disappearance of the parent Ascidiozooids.

METCALF summarises our knowledge of the neural gland in Tunicata—its position, size, origin, structure and function. The origin from the neural tube is readily demonstrated in *Molgula manhattensis* and in *Ecteinascidia turbinata*. The secretion of the gland is formed by the degeneration and disintegration of cells proliferated from the walls of the duct or its branches. No concretions are found. It is doubtful whether the gland has any renal function. The homology of the gland in *Salpa* with that of the Ascidians is doubtful. The ciliated funnel is not merely the aperture of the duct of the gland. It is richly innervated in some cases, and is probably a sense organ.

SEELIGER in the two new parts of his "Bronn" which have appeared during the year continues the detailed description of the Ascidiacea. He discusses the test very fully, chemically as well as histologically, and then passes to the internal organs taking first those in front of the branchial sac in the neighbourhood of the branchial siphon, such as the tentacles, the ganglion and subneural gland and the ciliated funnel of the dorsal tubercle. The figures both in the plates and in the text are excellent and many of them are new.

GIARD points out certain facts established by Verdun and others in regard to the Vertebrate lateral thyroids, or post-branchial bodies, which lead to the conclusion that these structures are homologous with the epicardial tubes of Tunicata. He also suggests that certain glandular masses on the branchial sac of *Botrylloides* may be the homologue of the thymus.

BALLOWITZ in several papers discusses minute cytological details, using the epithelium of *Salpa* and other forms. He finds annular nuclei which are normal and active. He suggests that centrosomes which may be superficial in position are receptive of external stimuli. He also describes sickle-shaped or crescentic nuclei, the concavities of which contain protoplasmic spheres with several centrosomes.

There is a good deal of anatomical detail in the systematic papers on new species by SLUITER, PIZON, and HERDMAN; and a revision of the known structure of the group is given by DELAGE & HÉROUARD.

B. EMBRYOLOGY.

KOROTNEFF describes a new (the third known) asexual form of *Anchinia* with a dorsal process bearing young primitive buds. This stage differs in its mode of budding from the other two asexual stages.

CRAMPTON shows that in the egg of *Molgula manhattensis* the maturation spindle is devoid of centrosomes. The sperm head on the other hand is preceded by a double centrosome. He gives further details (in his two papers) of the maturation and fertilization, showing a comparative independence of the processes undergone by the nucleus and the centrosomes.

BANCROFT finds that in a Californian species of *Distaplia* (*D. occidentalis*, Ritter) both ovary and testis are derived from a common rudiment very much as described by E. Van Beneden and Julin. The stalk of the incubatory pouch he finds is not a simple diverticulum of the peribranchial cavity but is double, consisting (1) of a tube which is continuous with the oviduct and which leads out to the apex of the pouch, and (2) of a narrow passage to the peribranchial cavity. The connection between the oviduct and the apex explains why that end of the pouch always contains the youngest embryos. The test-cells he finds are derived from the follicular epithelium, and they take no part in the formation of the test of the embryo.

LEFEVRE in his paper on budding in *Perophora* finds that in *P. viridis* the bud is formed of two vesicles, the outer derived from the ectoderm and the inner from the partition of the stolon. The bud is connected to the stolon last by the left hand peribranchial sac. The chief interest of the paper is the demonstration of the important part played by free cells of the blood in forming the commencements of various important organs of the body:—the pericardium and heart, the dorsal tube and nerve ganglion, the gonads and their ducts are all formed by blood cells. The development of the bud and that of the embryo do not proceed along parallel lines. The facts of budding will not harmonise well with the germ-layer theory.

PERRIER & PIZON on a re-consideration of the facts come to the conclusion that the double embryo in the Diplosomidæ is to be interpreted as

precocious budding (rather than as embryonic fission) due to acceleration in development (tachygenesis). PIZON confirms Salensky in regard to the details of development of *Diplosoma*, with some additions.

PIZON has followed the daily changes in the living colonies of *Botryllus* and *Botrylloides*, and finds, as might be expected from the colonial circulation, that the heart continues to beat after the death of the Ascidiozoid. He regards the reversal of the circulation as due to the engorgement of the ampullæ in the superficial parts of the colony. These when distended overcome the resistance of the heart's action and cause it to stop and then reverse. All the hearts in a colony contract simultaneously and in the same direction.

CRAMPTON has studied the development of isolated portions of embryos of *Molgula* up to a larva of small size with defects due to the fact that but a portion of the normal amount of material is available. The development begins as a partial one, but the missing part is gradually supplied by the cells present, and the final result is nearly complete.

For a discussion of the known Embryology, and especially of the facts of gemmation in the Tunicata, reference may be made to DELAGE & HÉROUARD.

C. GEOGRAPHICAL DISTRIBUTION.

A large number of new species have been described this year, and our knowledge of the geographical distribution of the group throughout extra-European seas has been considerably extended.

SLUITER has described twenty new species from the Antilles, and about thirty from South Africa. RITTER records eleven (of which ten are new) from Behring Sea in the neighbourhood of the Pribilof Islands; MICHAELSEN about seventeen (mostly new species or varieties) from the Southern ocean; and HERDMAN nine species (five new) from Puget Sound on the Pacific Coast of N. America. HERDMAN also has a preliminary list of the species described in his forthcoming "Catalogue of Australian Tunicata." The list contains about one hundred and eighty species of which about sixty-three are new.

FOWLER has some notes on *Doliolum tritonis* and *D. nationalis*. He discusses their horizontal and vertical distribution in the Faroë Channel, and considers the swarms that sometimes appear as due to periodic reproduction in great numbers. He also records the occurrence of *D. nationalis* in British waters at Plymouth and at Valentia.

GOTTSCHALDT, BUMPUS, MICHAELSEN, and PIZON also give us facts in regard to the occurrence or distribution of some species of Tunicata in extra-European localities.

III. SYSTEMATIC.

SLUITER describes about thirty new species of Simple and Compound Ascidians from South Africa, and discusses the classification of the group.

PERRIER in his note on classification wishes us to regard the Cynthiidae as the most ancestral group of the Tunicata, and argues that the simpler forms are not primitive but are secondarily simplified. He considers the Appendiculariidae as arrested larvæ.

PIZON describes from the Collection of the Paris Museum thirteen species of Molgulidae of which eight are new to science. He finds it necessary to form three new genera, and gives a revised classification of the family.

HERDMAN draws attention to the relationship of the Tunicata of Puget Sound to those of N. W. Europe, and considers that both are derived from

a common circumpolar fauna. In his list of Australian Tunicata he gives an outline classification of the group. DELAGE & HÉROUARD give a detailed classification and a full discussion of affinities in their "Zoologie Concrète."

MICHAELSEN does not define his new genera *Polyzoa* and *Agnesia*, and they appear to the Reporter to be indistinguishable from previously known forms, and therefore unnecessary.

GOTTSCHALDT describes twenty-two new species from Ternate, but unfortunately his plates show only the outsides of the animals. No anatomical details are represented.

Astropera sabulosa and *Ctenicella tumulus* described by PIZON as "new species" are avowedly merely re-descriptions of the *Ascidia sabulosa* and *Ascidia tumulus* of Quoy and Gaimard.

ASCIDIACEA.

ASCIDIÆ SIMPLICES.

CYNTHIIDÆ.

Boltenia legumen, forma *typica*, p. 363, forma *cunninghami*, forma *delfini*, forma *ohlini*, p. 364, MICHAELSEN, Zool. Anz. 1898.

B. georgiana, n. sp., *id.*, t. c. p. 364.

Cynthia torpida, p. 21, *chazaliei*, p. 22, *discrepans*, p. 23, SLUITER, Mem. Soc. Zool. France, xi, n. spp.

Microcosmus biconvolutus, p. 26, SLUITER, t. c.; *M. coalitus*, SLUITER, p. 57, Zool. Jahrb. Syst. xi : n. spp.

Styela canopus, Sav., var. n. *magelhaensis*, MICHAELSEN, p. 367, Zool. Anz. 1898.

S. nordenskiöldi, *steineni*, p. 365, *spirifera*, *ohlini*, p. 366, *pfefferi*, p. 367, *pæfsleri*, p. 368, MICHAELSEN, Zool. Anz. 1898; *S. natalensis*, p. 50, *anguinea*, p. 52, *rubida*, p. 53, SLUITER, Zool. Jahrb. Syst. xi; *S. joannæ*, HERDMAN, p. 264, Tr. Liverp. biol. Soc. xii; *S. (Polycarpa) nivos*a, *fuliginea*, p. 12, *friabilis*, p. 13, *insulsa*, p. 14, *brevipedunculata*, p. 15, *cartilaginea*, p. 16, *asiphonica*, p. 17, *appropinquata*, p. 18, *seminuda*, p. 19, SLUITER, Mem. Soc. Zool. France, xi : n. spp.

MOLGULIDÆ.

Gamaster, n. gen. for *G. dakarensis*, n. sp., PIZON, p. 328.

Astropera, n. gen. for *A. sabulosa*, n. sp., PIZON, p. 343.

Stomatropa, n. gen. for *S. villosa*, n. sp., PIZON, p. 379.

Molgula filholi, p. 347, *glomerata*, p. 354, PIZON, n. spp.; *M. contorta*, n. sp., SLUITER (30), p. 28; *conchata*, n. sp., SLUITER (29), p. 58; *M. pugetiensis*, n. sp., HERDMAN, p. 265.

Ctenicella tumulus, n. sp., PIZON, p. 366.

Ct. lebruni, n. sp., PIZON, p. 364.

Ct. rugosa, n. sp., PIZON, p. 372.

ASCIDIIDÆ.

Corella willmeriana, n. sp., HERDMAN, p. 252.

Ascidella incrustans, n. sp., HERDMAN, p. 255.

A. griffini, n. sp., HERDMAN, p. 256.

Ascidia compta, n. sp., SLUITER (29), p. 43.

A. sabulosa, n. sp., SLUITER (29), p. 45.

Ciona abdominalis, n. sp., SLUITER (30), p. 8.

Agnesia glaciata, n. gen. and n. sp., MICHAELSEN, p. 370.

CLAVELLINIDÆ.

Ecteinascidia garstangi, n. sp., SLUITER (29), p. 10.

ASCIDIÆ COMPOSITÆ.

POLYSTYELIDÆ.

Polyzoa pictonis, n. sp., MICHAELSEN, p. 368.

P. pictonis, var. nov. *wærni*, MICHAELSEN, p. 369.

P. cunninghami, n. sp., MICHAELSEN, p. 369.

Synstyela monocarpa, n. sp., SLUITER (29), p. 55.

BOTRYLLIDÆ.

Sarcobotrylloides herdmanni, GOTTSCHALDT, n. sp., p. 641.

Botrylloides chazaliei, n. sp., SLUITER (30), p. 10.

B. gregalis, n. sp., SLUITER (29), p. 46.

B. mœandrium, n. sp., SLUITER (29), p. 48.

DIDEMNIDÆ.

Leptoclinum conchyliatum, n. sp., SLUITER (30), p. 29.

L. cineraceum, n. sp., SLUITER (30), p. 30.

L. cretaceum, n. sp., SLUITER (29), p. 36.

L. ianthinum, n. sp., SLUITER (29), p. 38.

L. densipunctatum, n. sp., GOTTSCHALDT, p. 652.

L. asperum, n. sp., GOTTSCHALDT, p. 653.

L. læve, n. sp., GOTTSCHALDT, p. 654.

Diplosomoides circumscriptum, n. sp., GOTTSCHALDT, p. 655.

D. gelatinosum, n. sp., GOTTSCHALDT, p. 655.

D. perspicuum, n. sp., GOTTSCHALDT, p. 656.

Diplosoma globulare, n. sp., GOTTSCHALDT, p. 657.

D. molle, n. sp., GOTTSCHALDT, p. 657.

D. circumscriptum, n. sp., GOTTSCHALDT, p. 658.

D. ternatum, n. sp., GOTTSCHALDT, p. 658.

D. purpurea, n. sp., SLUITER (30), p. 32.

Didemnum decipiens, n. sp., GOTTSCHALDT, p. 646.

D. cœruleum, n. sp., GOTTSCHALDT, p. 647.

D. ramosum, n. sp., GOTTSCHALDT, p. 647.

Didemnoides ternatanum, n. sp., GOTTSCHALDT, p. 648.

D. giganteum, n. sp., GOTTSCHALDT, p. 649.

D. maculatum, n. sp., GOTTSCHALDT, p. 650.

D. patella, n. sp., GOTTSCHALDT, p. 651.

D. sulcatum, n. sp., GOTTSCHALDT, p. 651.

DISTOMIDÆ.

Distoma psammobium, n. sp., GOTTSCHALDT, p. 642.

D. maculatum, n. sp., GOTTSCHALDT, p. 644.

D. rhodopyge, n. sp., SLUITER (29), p. 12.

D. illotum, n. sp., SLUITER (29), p. 16.

- D. nitidum*, n. sp., SLUITER (29), p. 17.
D. modestum, n. sp., SLUITER (29), p. 18.
D. cæruleum, n. sp., SLUITER (29), p. 14.
Colella umbellata, n. sp., MICHAELSEN, p. 371.
C. multiplica, n. sp., GOTTSCHALDT, p. 645.

POLYCLINIDÆ.

- Polyclinum arenosum*, n. sp., SLUITER (29), p. 20.
P. isipingense, n. sp., SLUITER (29), p. 21.
P. pullum, n. sp., SLUITER (29), p. 23.
P. insulsum, n. sp., SLUITER (29), p. 25.
Psammaphidium pantherinum, n. sp., SLUITER (29), p. 26.
P. obesum, n. sp., SLUITER (29), p. 28.
P. funginum, n. sp., SLUITER (30), p. 31.
Amaroucium flavo-lineatum, n. sp., SLUITER (29), p. 30.
A. lubricum, n. sp., SLUITER (29), p. 31.
A. astræoides, n. sp., SLUITER (29), p. 33.
A. simplex, n. sp., SLUITER (29), p. 35.

VII. MOLLUSCA.

BY

E. R. SYKES, B.A., F.L.S.

Assisted by E. A. SMITH, F.Z.S., and G. C. CRICK, F.G.S.

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INTRODUCTION.

THE literature of the past year—1898—relating to Mollusca appears to be about equal in bulk to that of recent years and shows that much careful work has been done. What little change there is appears to be due to a slightly decreased number of papers dealing purely with descriptions of new forms.

TRYON'S Manual has made steady progress, PILSBRY (489) having in the terrestrial series continued his study of the *Bulimuli*, whilst in the marine, or first, series he has given an account of the *Aplacophora*, and, in conjunction with SHARP (488), has completed the monograph of the *Scaphopoda*, including a very valuable bibliographical index dealing with both

recent and fossil forms. This volume terminates the first series and it is understood that a third series, dealing with the *Pelecypoda*, is in contemplation. Seven parts of the 'Conchylien-Cabinet' (267) have appeared, relating to *Aplysiacea*, *Auriculacea*, *Cerithium* and *Zonites*. MOELLENDORFF (296) has commenced a supplemental volume, dealing chiefly with *Ennea*, to the Land Mollusca of Semper's 'Reisen im Archipel der Philippinen'; while BERGH (41) has continued his study of the *Pleurobranchidæ* in that publication and has also written (40) on the *Opisthobranchiata* collected by Plate in Chili.

A second volume of faunistic studies has been issued by KOBELT (225), dealing with the 'meridional sub-region'. The second, and final, volume on the Mollusca collected by the 'Travailleur' and 'Talisman' expeditions has appeared; LOCARD (243) deals in it chiefly with the *Pelecypoda*. BUCQUOY, DAUTZENBERG, and DOLLFUS (75) have completed their interesting work on the marine fauna of Roussillon, with supplemental notes, tables of distribution, &c. The brothers SARASIN (402) have issued a work on the freshwater fauna of Celebes, giving special attention to the *Melaniidæ*, which they divide into three groups, the *Palæo-*, *Neo-*, and *Tylo-Melaniidæ*, based mainly on the characters of the operculum and radula. GODWIN-AUSTEN (155) has continued his work on the Indian Land Mollusca. A very valuable catalogue of the land fauna of the Philippines has been written by MOELLENDORFF (291), and a useful checklist of the non-marine fauna of South Africa by MELVILL and PONSONBY (284); we may further refer, in dealing with non-marine mollusca, to PALLARY'S (324) paper on Morocco, that of MOELLENDORFF (294) on Annam, and SMITH'S (433) contribution to our knowledge of Lombok, also to MARTENS' (259) continuation of the 'Biologia Centrali-Americana'.

The anatomical papers have been both numerous and valuable; AMAUDRUT (8) has dealt with the anterior portion of the digestive tube, STEMPPELL (452) and VAYSSIÈRE (492), respectively, with the general anatomy of the *Nuculidæ* and *Pleurobranchidæ*, and WISSELL (520) with *Onchidiella*. Several papers by MOORE (299-304) on the anatomical and conchological characters of the Mollusca of Lake Tanganyika—which he appears to consider as representing an old Jurassic Sea—have appeared. WIEGMANN (515) has dealt with the anatomy of some terrestrial Mollusca collected by Kükenthal in Halmahera and other neighbouring islands, and JACOBI (199) with that of some Japanese *Helicidæ* and *Zonitidæ*. BOUVIER and FISCHER (58) have written an elaborate account of the recent species of *Pleurotomaria*. A portion of the results of BERNARD'S (44) careful study of the development of the hinge in the *Pelecypoda* has now appeared in collected form; we may also note some suggestive remarks by BEECHER (34) on the origin and nature of spines on the shells of Mollusca, and the description by BAKER (23) of the protoconch of many *Gastropoda*. JOUBIN (202-5) has written some interesting papers on the *Cephalopoda*; CRICK (95) has dealt with the muscular attachment of the *Ammonoidea* and also issued (94) a list of figured Fossil Cephalopod types in the British Museum.

To Systematists the work of VERRILL and BUSH (493) on the *Pelecypoda* of the Atlantic coast of North America will be of interest, as also that of ANDRUSOV (17) on the recent and fossil *Dreissensiidæ*. A list of the Marine Mollusca of Victoria has been commenced by PRITCHARD and GATLIFF (370): the European cave-fauna has been noticed by HAMAN (170). KOBELT and MOELLENDORFF (229) have continued their list of the non-marine operculata; several pages published in 1897 have been reprinted with corrections, including the addition of a new genus not in the original.

A new part of the 'Tertiary Fauna of Florida' has been issued by DALL (103); it contains diagnoses of some genera, of which the names alone were published in 1895, and many systematic notes of importance to students of the recent Mollusca.

An index to the 'Journal de Conchyliologie' from 1873—1892 has been published, and it is most satisfactory to state that the lamented death of Mons. Crosse will cause no break in the appearance of this periodical.

In conclusion, an example is appended of a new method of diagnosing Mollusca, used by BUCKMAN (73) in dealing with the *Cephalopoda*: "Substeno-subleptogyral, latumbilicate, subcrassi-subirregulari-bullicostate, rursi-recti-costate, subalti-septecarinata"!

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II. BIOLOGY.

A.—ANATOMY, PHYSIOLOGY.

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b. PALÆOTROPICAL AFRICAN ZONE.

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9. *South African Region.*

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11. *Afro-Arabian Region.*

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c. PALÆOTROPICAL ORIENTAL ZONE.

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Tonkin:—Land and freshwater, with n. spp. of *Clausilia*, *Helicarion*, *Helix*, *Paludina*, and *Pupina*; FISCHER (143): *Streptaxis sinensis*, n. var.; ANCEY (10).

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14. Indo-Malay Region.

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15. Philippine Region.

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d. AUSTRALIAN ZONE.

16. *Austro-Malayan Region.*

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17. *Australian Region.*

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18. *Austro-Polynesian Region.*

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19. *Polynesian Region.*

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20. *Neozelanian Region.*

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e. NEANTARCTIC ZONE.

21. *Patagonian Region.*

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22. *Chilian Region.*

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f. NEOTROPICAL ZONE.

23. *Peruvian Region.*

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24. *Colombian Region.*

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25. *Brazilian Region.*

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Bolivia:—*Bulimulus (Drymæus) malleatus*, n. sp.; DA COSTA (102).

26. *Mexican Region.*

Central-America:—Criticism of von Martens [Zool. Rec. xxxiv, p. 17 (283)]; PILSBRY, Nautilus, xii, pp. 11 & 12.

Mexico:—New species of *Subulina*, *Pseudosubulina* and *Leptinaria*; MARTENS (259): *Ceres nelsoni*, n. sp.; DALL (111): *Pisidium singleyi*, n. sp.; STERKI (453).

Nicaragua:—New species of *Leptinaria*; MARTENS (259).

Guatemala:—New species of *Subulina*, *Pseudosubulina*, *Tornaxis* (n. g.), *Leptinaria*, and *Veronicella*; MARTENS (259).

Costa Rica:—New species of *Spiraxis*, *Leptinaria* and *Succinea*; MARTENS (259).

Cocos Island, off Costa Rica: New species of *Succinea* and *Tornatellina*; MARTENS (261).

27. *Caribbean Region.*

Bahamas:—*Strophia cylindrica*, n. sp.; MAYNARD (272): Land shells of Gun Cay; PILSBRY (348).

Curaçoa and neighbouring islands:—Non-marine of, with n. spp. of *Pineria* and *Neosubulina* (n. gen.); SMITH (437).

Jamaica:—*Ravenia hollandi*, n. sp.; HENDERSON (180).

Trinidad:—Land and freshwater species, with n. spp. of *Guppya*, *Luntia* (n. gen.), *Sophina*, and *Vitrea*; SMITH (429).

Cuba:—New species of *Strophia*; MAYNARD (272): New species of *Cerion*; PILSBRY & VANATTA (359).

Hayti:—*Strophia ferruginea*, n. sp.; MAYNARD (272).

g. NEARCTIC ZONE.

28. *American Region.*

North America:—Catalogue of land shells concluded; PILSBRY (345): Revision of genera *Anadenulus*, *Binneya*, *Hemphillia*, *Hesperarion*, and *Prophysaon*; PILSBRY & VANATTA (357).

United States:—*Pisidium roperi*, n. sp., and new varieties of *Pisidium*; STERKI (456).—Hudson Highlands: Land and freshwater; MEARNES (275).—Western New York: Fauna with n. vars. of *Polygyra tridentata*; BAKER (20).—Cincinnati: Land and freshwater shells of vicinity; HARPER (172).—Michigan: *Unionidæ* of; WALKER (500).—Florida: *Ampullaria pinei*, n. sp.; DALL (115): *Macroceramus floridanus*, n. sp.; PILSBRY (347): *Unio strodeanus*, n. sp.; WRIGHT (527): *Unio reclusus*, n. sp.; WRIGHT (525):

Unio villosus, n. sp.; WRIGHT (528).—Washington: *Punctum clappi*, n. sp.; PILSBRY (346).—Michigan: *Amnicola walkeri*, n. sp.; PILSBRY (349).—Gt Smoky Mts., U. S. A., *Gastrodonta lamellidens*, n. sp.; PILSBRY (346).—Oregon: *Punctum clappi*, n. sp.; PILSBRY (346).—Missouri: Land shells; BAKER, Nautilus, xii, p. 36.—Michigan: New *Pisidia*; STERKI (453).—Ohio: *Pisidium splendidulum*, n. sp.; STERKI (453).—Louisiana: *Unio (Lampsilis) amphicenus*, n. sp.; FRIERSON (148).—Alabama: *Unio triumphans*, n. sp.; WRIGHT (524).—Maryland: *Vitrea raderi*, n. sp.; DALL (108).—Missouri: *Amnicola missouriensis*, n. sp.; PILSBRY (349).—Chicago drainage canal: *Mollusca*; BAKER (26).—Chicago area: *Pelecypoda* of; BAKER (24).—Joliet, Ill.: *Sphærium tilycashense*, n. sp.; BAKER (25).—Colorado: *Pyramidula cockerelli*, n. sp.; PILSBRY (354).—Tennessee: *Gastrodonta clappi*, n. sp.; PILSBRY (354).—Texas: *Unio iheringi*, n. sp.; WRIGHT (529): *Macroceramus texanus*, n. sp.; PILSBRY (347).—Georgia: New variety of *Polygyra lawæ*; PILSBRY (347).—Ohio: Occurrence of *Unio complanatus*; STERKI, Nautilus, xii, p. 24.—Spoon River and Illinois River: *Unionidæ*; STRODE, Nautilus, xii, p. 8.

29. Californian Region.

California:—New varieties of *Epiphragmophora*; PILSBRY (347): *Valonia pulchella* in; WILLIAMSON, Nautilus, xii, p. 71: *Punctum californicum*, n. sp.; PILSBRY (346).—Redding, Cal.: Land and freshwater; PILSBRY, Nautilus, xii, pp. 59 & 60.

Arizona and New Mexico:—*Bifidaria ashmuni*, n. sp.; STERKI (455).

Arizona:—New species of *Bifidaria*; STERKI (458).

New Mexico:—*Polygyra altissima*, n. sp., and new var. of *P. rhyssa*; COCKERELL (84): *Polygyra mioryssa*, n. sp.; DALL (114): *Pyramidula cockerelli*, n. sp.; PILSBRY (354).

Clarion Island, off Cape St Lucas:—*Succinea mcgregori*, n. sp.; PILSBRY (342).

30. Canadian Region.

N. America:—*Limnæa præcellens*, n. sp.; WESTERLUND (507).

Quebec:—Notes on some land shells; HANHAM (171).

British Columbia:—List of land and freshwater species; NEWCOMBE (312).

Alaska:—*Zonitoides randolphi*, n. sp.; PILSBRY (354).

Dyea, Klondyke:—Land and freshwater shells; CLAPP, Nautilus, xii, p. 24.

Greenland:—Fauna; POSSELT (367).

MARINE MOLLUSCA.

General notes on distribution; BROECK (67).

1. Arctic Province.

Arctic Regions:—Two species of *Cephalopoda*; LÖNNBERG (251).

Greenland:—Fauna, with n. spp. of *Nucula* and *Sipho*, and several varieties; POSSELT (367).

2. Boreal Province.

Note on deep-water fauna of North Atlantic; LOCARD (245).

Shetland:—Mollusca of Lochs; SCOTT & DUTHIE (413).

Ulvesund, Norway:—Marine *Mollusca*; GRIEG (165).

3. *Celtic Province.*

British Islands:—Notes on many species; MARSHALL (258): Notes on some species; CHASTER, J. Conch. ix, pp. 53 & 54.—Falmouth: Several species from; VALLENTIN, J. Inst. Cornwall, xiii, pp. 262–264.—Plymouth: *Sepia elegans*; H. & B., J. Mar. Biol. Assoc. v, p. 343.—Dorsetshire: Marine Fauna; MANSEL-PLEYDELL (255).—St Andrews Bay: *Clione limacina*; McINTOSH (274).—Firth of Forth: Pelagic Mollusca; SCOTT (411).—Achill: Marine fauna of; TATLOW & PRAEGER, Irish Natural. vii, pp. 139 & 140.—Isle of Man: Fauna of; ADAMS, Sci. Gossip, v, pp. 98–100.

Belgium:—Marine fauna; LAMEERE (238).

Borkum I.:—Marine mollusca from; SCHNEIDER (410).

4. *Lusitanian Province.*

Notes on deep water fauna of Atlantic and Mediterranean; LOCARD (245).

France:—Fauna; ACLOQUE (2): List of the edible Mollusca of the brackish ponds of the south of France, with an account of the fishery; GOURRET (158).—Brittany: Fauna of coasts compared with that of Gulf of Lyons; PRUVOT (371).—Loire-Inférieure: Marine Mollusca; DAUTZENBERG (118).—Gulf of Gascony: New species of *Adeorbis* and *Diplodonta*; LOCARD (243).—Nice: *Galliteuthis armata*, n. sp.; JOUBIN (205).—Rousillon: Fauna concluded, with notes on the Mollusca of the Mediterranean; BUCQUOY, DAUTZENBERG & DOLLFUS (75).—Lyons: Fauna of Gulf compared with that of coasts of Brittany; PRUVOT (371).

Spain:—New species of *Cuspidaria*, *Diplodonta*, & *Mytilimeria*; LOCARD (243).

Portugal:—Marine fauna; NOBRE (318): New species of *Cuspidaria*, *Gibbula* and *Solariella*; LOCARD (243).

Mediterranean:—*Cypræidæ* of; MONTEROSATO (297).

Corsica:—*Emarginula intervecta*, n. sp.; LOCARD (243).

Naples:—*Pleurobranchus ypsilophora*, n. sp.; VAYSSIÈRE (492).

Adriatic:—Fauna; BRUSINA (68).

N. W. Africa:—New species of *Anomia*, *Arca*, *Capulus*, *Chiton*, *Dentalium*, *Emarginula*, *Fissurella*, *Gibbula*, *Leda*, *Limopsis*, *Lucina*, *Mytilimeria*, *Puncturella*, *Verticordia* and *Zizyphinus*; LOCARD (243).

Morocco:—Small collection of marine shells; MABILLE (253): New species of *Cuspidaria*, *Dentalium*, *Gibbula*, *Patella*, *Pholadomya*, *Solariella*, and *Verticordia*; LOCARD (243): *Cyclostrema dautzenbergianum*, n. sp.; ANCEY (10).

Algiers:—Marine shells, with n. spp. of *Cyclostrema*; ANCEY (13).

Azores:—New species of *Cuspidaria*, *Dentalium*, *Limopsis*, *Patella*, *Turricula*, and *Verticordia*; LOCARD (243): *Grimalditeuthis richardi*, n. gen. & sp.; JOUBIN (203).

Canaries:—New species of *Cuspidaria*, *Lucina*, and *Mytilimeria*; LOCARD (243): Small collection of marine with new var. of *Calliostoma conuloides*; MABILLE (253).

5. *Aralo-Caspian Province.*

Caspian:—New species of *Dreissensia*; ANDRUSOV (17).

Aral Sea:—*Dreissensia andrusovi* (Brus. MS.), n. sp.; ANDRUSOV (17).

6. *West African Province.*

Cape Verdes:—New species of *Crepidula*, *Gibbula*, *Hinnites* (?), *Siphonaria*, and *Solariella*; LOCARD (243).

7. *South African Province.*

S. Africa:—Note on two species of *Ischnochiton*; SYKES (470).

8. *Indo-Pacific Province.*

Mauritius:—*Pleurobranchus cuvieri*, n. sp.; BERGH (41).

Mozambique:—*Pleurobranchus papuligerus*, n. sp.; BERGH (41).

Suez Canal:—Mollusca of; BAVAY (30).

Gulf of Aden:—Mollusca from; DALL (106): Notes on fauna, with n. spp. of *Aclis*, *Calyptræa*, *Coralliophila*, *Eulima*, *Gari*, *Leiostraca*, *Leptothyra*, *Mangilia*, *Nassa*, *Novaculina*, *Pectunculus*, *Petricola*, *Semele*, *Tellina*, and *Thracia*; MELVILL (281).

Red Sea:—*Octopus horsti*, n. sp.; JOUBIN (202): New species of *Issina*, *Otitoma*, *Thala*, and *Lunella*; JOUSSEAUME (208, 210, 212): Pelagic fauna; STEUER (459): *Triphoridae*, with n. spp. of *Euthymia*, *Inella*, *Mastonia*, *Obesula* (n. gen.), and *Viriola*; JOUSSEAUME (206).

Erythræa:—Pearl fishery; HESSE (185).

Arabia:—*Fusus arabicus*, *Periploma indicum*, n. spp.; MELVILL (280).

Muscat:—New species of *Cythara*, *Lima*, *Murex*, and *Tellina*; MELVILL (280).

Persian Gulf:—New species of *Conus*, *Diplodonta*, *Eulimella*, *Gari*, *Lachesis*, *Leucotina*, *Marginella*, *Mytilicardia*, *Ostrea*, *Pleurotoma*, *Plicatula*, *Scalaria*, *Turbonilla*, and *Yoldia*; MELVILL (280).

Mekran Coast:—New species of *Bullia* and *Strombus*; MELVILL (280).

Karachi:—New species of *Basterotia*, *Bullia*, *Cerithiopsis*, *Miralda*, *Nerita*, *Terebra*, *Tornatina*, *Trochus*, and *Turbonilla*; MELVILL (280).

Indian Ocean:—Species of *Cardium*, *Cuspidaria*, *Dentalium*, *Myonera*, *Natica*, *Pleurotoma*, *Scrobicularia*, *Yoldia*, described by E. A. Smith in 1896, figured by ALCOCK & ANDERSON (5): *Circe nana*, n. sp.; MELVILL (280).—Angrias Bank: New species of *Ancilla*, *Pleurotoma*, and *Tellina*; MELVILL (280).—Bombay: *Raetina indica*, n. sp.; DALL (103).—Malabar Coast: New species of *Marginella*; MELVILL (280).

Madras:—Marine shells, with n. spp. of *Cadulus*, *Cerithium*, *Colina*, *Rissoina*, *Sanguinolaria*, *Syrnola*, and *Turbonilla*; MELVILL & STANDEN (285).—Ceylon: *Calliostoma duricastellum*, n. sp.; MELVILL (280): *Morchia mariæ*, n. sp.; JOUSSEAUME (211).

Andaman Is.:—*Ancilla sura*, n. sp.; JOUSSEAUME (210): Shells from, with new species of *Terebra*; MELVILL & SYKES (287).

Singapore:—*Cadulus singaporensis*, n. sp.; PILSBRY in TRYON (488).

St Paul (Indian Ocean):—Notes on several *Pelecypoda*; BERNARD (43).

Philippines:—*Pleurobranchus diaphanus*, n. sp.; BERGH (41): *Mondonta quadrasi*, n. sp.; SOWERBY (441).

Borneo:—*Terebra eximia*; STANDEN, J. Conch. ix, p. 95.

New Britain:—*Latiaxis couturieri*, n. sp.; JOUSSEAUME (208).

Amboina:—*Pleurobranchus strubelli*, n. sp.; BERGH (41): *Octopus hoeki*, n. sp.; JOUBIN (202).

Hawaiian Islands:—*Cypræidæ* of; BALDWIN, Nautilus, xi, p. 123.

Solomon Islands:—New species of *Conus*; BRAZIER (63).

Santa Cruz, S. Pacific:—*Lima alata*, n. sp.; HEDLEY (178).

Fiji:—*Calobates fluviatilis*, n. sp.; HEDLEY (176).

New Caledonia:—Some species from, with n. spp. of *Ischnochiton*, *Teinostoma*, and *Rissoina*; HEDLEY (177): *Pecten (Amussium) milne-edwardsi*, n. sp.; GREGORIO (163): Gastropods from; HERVIER (183): New species of *Triforis*; HERVIER (184).

9. *Australo-Zealandic Province.*

Australian Seas :—Notes on *Teredinidæ* of ; HEDLEY (176).

Victoria :—Checklist of marine mollusca ; KENYON (220) : List of marine fauna commenced ; PRITCHARD & GATLIFF (370) : *Coralliophila wilsoni*, n. sp. ; PRITCHARD & GATLIFF (369) : *Philobrya fimbriata*, n. sp. ; TATE (475) : New species of *Axinæa*, *Conus*, and *Voluta* ; BRAZIER (63) : New species of *Columbella*, *Conus*, *Lucina*, and *Tellina* ; BRAZIER (64).

New South Wales :—New species of *Eulima* ; TATE (474).—Sydney : Popular notes on Marine fauna ; HEDLEY (175).

S. Australia :—New species of *Eulima*, *Eulimella*, *Odontostomia* and *Turbonilla* ; TATE (474) : *Philobrya fimbriata*, n. sp. ; TATE (475) : New species of *Acanthochites* and *Chiton* ; TORR & ASHBY (484) : *Dentalium bednalli*, n. sp. ; SHARP & PILSBRY in TRYON (488) : *Mylytta inæqualis*, n. sp. ; DALL (112).

Tasmania :—*Philobrya fimbriata*, n. sp. ; TATE (475) : *Cypræidæ* of, with new varieties ; BEDDOME (33) : New species of *Eulima* and *Odontostomia* ; TATE (474).

New Zealand :—*Rissoiidæ* of, with n. spp. of *Rissoia* and *Barleeia* ; SUTER (463) : New species of *Macoma*, *Mactra*, *Mitra*, and *Myrina* ; SMITH (432).—Christchurch : Mollusca found on New Brighton Beach ; DENDY (119).

Macquarie Island :—New species of *Cyamium*, *Modiolarca*, and *Paludestrina* ; SMITH (432).

Stewart Island :—*Cyamiomactra*, *Pachykellya*, *Perrierina*, new genera with n. spp. ; BERNARD (42).

10. *Japonic Province.*

Japan :—*Cardium vulva*, n. sp. ; JOUSSEAUME (209) : *Sepioteuthis sieboldi*, n. sp. ; JOUBIN (202) : *Raetella tenuis*, n. sp. ; DALL (103) : Notes on Chitons with *Ischnochiton mitsukurii*, n. sp. ; PILSBRY (350).

11. *Aleutian Province.*

Alaska :—*Margarita sharpii*, n. sp. ; PILSBRY (344).

British Columbia :—List of Marine species ; NEWCOMBE (312).

12. *Californian Province.*

N. America, Pacific Coast :—*Psammobiidæ* of ; DALL (104) : New species of *Cadulus* ; PILSBRY in TRYON (488).

California :—Varieties of *Cytherea crassatelloides* ; STEARNS (447) : Collection of Chitons, with n. spp. of *Mopalia* and *Nuttallina* ; PILSBRY (341) : New species of *Cadulus* ; PILSBRY in TRYON (488) : *Fusus* (*Roperia*, n. sect.) *roperi*, n. sp. ; DALL (110).—Newport : Notes on a few species ; ANON., Nautilus, xi, p. 104.—San Diego : Mollusca from ; KELSEY (216).—Orange : Marine shells from ; BRADSHAW, Nautilus, xii, p. 9.

13. *Panamic Province.*

Mexico :—*Cadulus panamensis*, n. sp. ; PILSBRY in TRYON (488).

Panama :—New species of *Cadulus* ; PILSBRY in TRYON (488).

Ecuador :—New species of *Cadulus* ; PILSBRY in TRYON (488).

Socorro I., off Cape St Lucas :—Notes on Chitons ; PILSBRY (350).

14. *Peruvian Province.*

Chili:—*Opisthobranchiata*, with new species of *Aplysiopsis*, *Pleurobranchus*, *Archidoris*, *Anisodoris*, *Platydoris*, *Tyrinna*, *Chromodoris*, *Euplocamus*, *Candiella*, *Cratena*, and *Phidiana*; BERGH (40).

Juan Fernandez I.:—*Onchidiella juan-fernandeziana*, n. sp.; WISSELL (520).

15. *Antarctic Province.*

[None.]

16. *Patagonian Province.*

Patagonia:—New species of *Cadulus*; PILSBRY in TRYON (488).

Falkland Islands:—Collection from, with n. spp. of *Cyamium*, *Lachesis*, and *Thracia*; MELVILL and STANDEN (286).

17. *Caribbean Province.*

Yucatan:—*Tethys pilsbryi*, n. sp.; LETSON (239).

Cuba:—*Olivella blanesi*, n. sp.; FORD (146).

Texas:—*Terebra texana*, n. sp.; DALL (113).

18. *Transatlantic Province.*

Atlantic Coast of N. America:—Revision of *Pelecypoda*, with n. spp. of *Axinopsis*, *Bathyarca*, *Callocardia*, *Cetoconcha*, *Clidiophora*, *Cryptodon*, *Cuspidaria*, *Halonympha*, *Kennerlia*, *Leptaxinus* (n. gen.), *Axinodon* (n. gen.), *Limatula*, *Limopsis*, *Lyonsia*, *Lyonsiella*, *Malletia*, *Martesia*, *Montacuta*, *Myonera* (?), *Nucula*, *Periploma*, *Solemya*, *Tindaria*, *Yoldia*, and *Yoldiella*; VERRILL & BUSH (493): *Psammobiidae* of; DALL (104).

Cape Hatteras:—New species of *Cadulus*; PILSBRY in TRYON (488).

Cape Florida:—New species of *Cadulus*; PILSBRY in TRYON (488).

Long Island:—Mollusca of Coldspring Harbour; DAVENPORT, Science, viii, p. 686.

Maine:—Marine shells; HENDERSON (181).

GEOLOGICAL.

N.B.—The same remarks apply here that are given at the beginning of the preceding section.

Geology of East Greenland, with n. spp.; BAY (31): *Gastropoda* from Java, with many new species; MARTIN (264): Fossils from 'étage de Vitrolles' on borders of Cretaceous and Tertiary; VASSEUR, C.R. Ac. Sci. cxxvii, p. 890: List of shells collected in the sands of Châlons-sur-Vesle, Chenay and neighbouring localities; PLATEAU (364).

1. POST-TERTIARY.

British Isles:—Holocene and Pleistocene Mollusca from Dover; BULLEN (76).—Post-pliocene of Felstead, Essex; KENNARD & WOODWARD (218).—Post-Pliocene non-marine mollusca of Essex; KENNARD & WOODWARD (217): Shell-bearing drift on Moel Tryfan; UPHAM, Amer. Geol. 1898, pp. 81-86.

France:—Sub-marine deposit of shells in the neighbourhood of Cape Creus, Gulf of Lyons; PRUVOT & ROBERT (372).—Quaternary land-shells from Montigny: DOLLFUS, C.R. Ac. Sci. cxxvi, p. 1369.—Quaternary species from cave of Mas d'Azil (Ariège); FISCHER (141).

Germany:—Diluvial shells of Brüheim in Gotha; HOCKER (190).

Greenland:—Pleistocene shells from elevated beach at Pagtorfik; WHITE & SCHUCHERT, Bull. Geol. Soc. America, ix, p. 349.

North America:—Quaternary shells at Long Beach, Cal.; CAMPBELL, Nautilus, xii, p. 7.—Fauna of shell-heaps of Block Island, New England; EATON (132).—Interglacial shells at Toronto; LEMON, Nautilus, xii, pp. 6 & 7.—Deposits of Nantucket; MERRILL (288).—*Actæon traski*, as n. sp., from Quaternary of San Diego, California; STEARNS (446).—*Mollusca* found with remains of Mastodon in Indiana; WALKER (502).

S. Australia:—Pleistocene deposits, with n. spp. of *Odontostomia* and *Pseudoliotia* (n. gen.); TATE (472).

2. TERTIARY.

Bibliographical list of *Scaphopoda*; PILSBRY in TRYON (488).—Tertiary *Dreissensiidæ* of Eurasia, with n. spp.; ANDRUSOV (17).—*Patella pyramidalis*, note on; VINASSA DE REGNY, Rev. Paleozool. ii, p. 36.—*Voluta pyriformis*, note on; VINASSA DE REGNY, t. c. p. 134.—*Oryctomya claibornensis*, n. subgen. (of *Coralliophaga*) and sp. from Claiborne sands; DALL (109).—On *Pholadomya fuchsi*; SCHAEFFER (406).—On the genus *Amusium*, with new names and varieties; GREGORIO (163).—New species of landshells from tertiary of Baux; NICOLAS (316).—Tertiary of Aix-en-Provence; VASSEUR, Ann. Fac. Marseille, viii, pp. 163–171.—Lists of Mollusca, with *Melanopsis depereti*, n. sp., from the Jura; BOISTEL, Bull. Soc. geol. France, xxvi, pp. 11–35.—List of fossil from Felsö-Lapugy; KOCH, Foldtani Kozl. xxviii, pp. 215–218.—Lists of fossils from Artesian well borings in Vienna; ABEL, Jahrb. geol. Reichsanst. xlvii, pp. 479–504.—Fossils from Theben-Neudorf in Hungary, with new species of *Mitra*, *Pholadomya* and *Pleurotoma*; SCHAEFFER (407).—Fauna of Letkes, Hungary; FRANZENAU (147).—Land Mollusca from Bohemia, with n. spp.; BABOR (19).—Fossils from Eggenburg; ABEL, Beitr. Pal. Oesterr.-Ung. xi, pp. 211–226.—Shells from San Severino (Marche); DE ANGELIS D'OSSAT & LUZZI, Boll. Soc. geol. Ital. xvi, pp. 61–68.—*Pelecypoda* of Piedmont and Liguria; SACCO (399).—Mollusca from the Venetian Alps, with several n. spp.; VINASSA DE REGNY (496).—Fauna of Timok Tertiaries of Krain, with n. spp.; RADOVANOVIČ & PAVLOVIČ (378).—Fossils of North Greece with new species; PENECKE (336).—Lower Tertiary Shells from Egypt, with n. spp. of *Arca*, *Pecten*, and *Spondylus*; NEWTON (314).—New *Mollusca* from Egypt; MAYER-EYMAR (268).—Fauna of the Lower Saharian in the neighbourhood of Cairo, with several new species; MAYER-EYMAR (271).—Fauna from Interior of Borneo, with n. spp.; MARTIN (266).—Australian tertiary *Philobryæ*, with n. spp.; TATE (475).—Fauna of older Tertiary of Australia, with n. spp.; TATE (471).—*Psammobiidæ* of N. America; DALL (104).—Tertiary of Florida, review of *Pelecypoda* commenced, with new genera and species; DALL (103).—Tertiary horizons in Chili; ORTMANN (322).

Pliocene:—Mollusca from St Erth, with n. spp.; BELL (36).—List of Mollusca from Palombara-Marcellina; CERULLI-IRELLI & DE ANGELIS D'OSSAT, Boll. Soc. geol. Ital. xvii, pp. 88–90.—Review of fauna of Castellarquato; NAMIAS (309).—Deposit at Dismal Swamp, Virginia and North Carolina, is, from *Mollusca*, probably Pliocene; WOOLMAN (523).

Miocene:—Fauna of localities in Volhynia; MIKLAILOVSKI (290).—*Pelecypoda* of Tongrian of Liguria, with new sections and species;

ROVERETO (395).—Tongrian and Ligurian of Egypt; MAYER-EYMAR (269, 270).—Fauna of Strata of Gippsland Lakes Area; DENNANT & CLARK (121).

Oligocene:—*Potamides* of Gaas (Landes), France; VIGNAL (494).—Mollusca from Priabona; VINASSA DE REGNY (497).

Eocene:—Fauna of Saratow; NETSCHAEW (311).—Eocene of Loire-Inférieure: *Gastropoda*, with new species; COSSMANN (91).—Freshwater shells in Lower Eocene near Coustonge; BRESSON, C.R. Ac. Sci. cxxvii, p. 836.—Fauna of Lower Leigh Valley, Victoria; DENNANT & MULDER (122).—Eocene *Gastropoda* from Victoria with *Solutofusus*, n. gen., and n. spp.; PRITCHARD (368).—Fossils of deep borings in S. Australia; TATE, Tr. R. Soc. S. Austral. xxii, p. 194.—New species from Alabama; ALDRICH (6).—*Pecten dalli*, n. n. for *P. rogersi*, nom. præocc.; CLARK, Johns Hopkins Univ. Circ. No. 137, p. 18.

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- Hemiplecta*, list of species and anatomy of *H. humphreysiana*; GODWIN-AUSTEN (155): *H. densa*, anatomy of; WIEGMANN (515): *H. divergens*, Brancsik, is the same as *H. granigera*, Ancey; ANCEY, P. Linn. Soc. N. S. Wales, xxii, p. 771.
- Hyalinia* (*Polita*) *kasnakowi*, Turkestan; WESTERLUND, Ann. Mus. St. Petersb. 1898, p. 155: *H. angulata*, Denmark; WESTERLUND, Acta Soc. Faun. Fenn. xiii, No. 7, p. 36: *H. maroccana*, Marocco; PALLARY, J. Conchyl. xlii, p. 60: n. spp.
- Inozonites spiriplanus*, Philippines; MOELLENDORFF, Abh. Ges. Görlitz, xxii, p. 72: n. sp.
- Kaliella subturritula*, anatomy; WIEGMANN (515), pp. 65-68.
- Kaliella nematorhaphe*, *subnodosa*, (?) *tonglonensis*, Philippines; MOELLENDORFF, Nachrbl. Deutsch. malak. Ges. 1898, p. 8: *K. delectabilis*, Ceylon; SYKES, P. Malac. Soc. London, iii, p. 70, fig.: n. spp.
- Lamarckiella*, n. sect. of *Rhysota* for *Helix lamarckiana*, Lea; MOELLENDORFF, Abh. Ges. Görlitz, xxii, p. 66.
- Lamprocystis annamitica*, Annam; MOELLENDORFF, Nachrbl. Deutsch. malak. Ges. 1898, p. 68: n. sp.
- Limax flavus*, abnormality of; OLDHAM, Naturalist, 1898, p. 240.
- Limax turkestanus*, Turkestan, *daghestanus*, p. 54, *ananowi*, *caucasicus*, p. 55, *amalioides*, p. 56, *colchicus*, p. 57, *simplex*, *valentini*, p. 58, *baeri*, p. 59, *retowskii*, p. 61, Caucasus; SIMROTH, Ann. Mus. St. Petersb. 1898: n. spp.
- Macrochlamys* (?) *resplendens*, anatomy; GODWIN-AUSTEN (155).

- Macrochlamys dohertyi*, Enganio I.; HENDERSON, Nautilus, xii, p. 16, fig.:
M. callojuncta, Laos; ANCEY, Bull. Mus. Marseille, i, p. 129, fig.: n. spp.
- Mariella*, review of genus, with anatomy; WEBB (504): *M. dussumieri* really comes from India and not Seychelles; COCKERELL, Nautilus, xii, p. 10.
- Medyla viridis*, anatomy of; WIEGMANN (515).
- Medyla excavata*, Philippines; MOELLENDORFF, Abh. Ges. Görlitz, xxii, p. 42: n. sp.
- Microcystina lita*, Ceylon; SYKES, P. Malac. Soc. London, iii, p. 70, fig.: n. sp.
- Microparmarion*, notes on; SIMROTH, Zool. Jahrb. (Syst.) xi, p. 151.
- Microparmarion fruhstorferi*, p. 164, *boettgeri*, p. 165, Java; SIMROTH, Zool. Jahrb. (Syst.) xi, figg.: *M. fultoni*, p. 191, *constrictus*, p. 192, Lombock; COLLINGE, Ann. Nat. Hist. i, figg.: n. spp.
- Nanina (Hemiplecta) patens*, Java; MARTENS, SB. Ges. naturf. Berlin, 1898, p. 160: *N. (H.) marangensis*, Sumatra; ALDRICH, Nautilus, xii, p. 2, fig.: n. spp.
- Nilgiria*, n. gen., type *Helix solata*, Bens., with anatomy of several species; GODWIN-AUSTEN (155), p. 77.
- Omphalina fuliginosa*, n. var.; PILSBRY, Nautilus, xii, p. 86.
- Paravitrea*, n. sect. of *Vitrea*, first species *V. capsella*; PILSBRY, *op. cit.* xi, p. 130.
- Parnacella*, anatomy of; SIMROTH, Ann. Mus. St. Petersb. 1898, p. 124.
- Parnacochlea*, notes on; SIMROTH, Zool. Jahrb. (Syst.) xi, p. 151.
- Parnacochlea smithi*, York Peninsula, N. Australia; SIMROTH, *t. c.* p. 158, fig.: n. sp.
- Parmarion*, note on anatomy; GODWIN-AUSTEN (155): Notes on; SIMROTH, Zool. Jahrb. (Syst.) xi, p. 151.
- Parmarion cambodjensis*, Cambodia, p. 159, *nicholitzi*, p. 160, Natuna I.; SIMROTH, *t. c.*, figg.: *P. maculosus*, Java, p. 299, (?) *dubius*, Borneo, p. 305; WIEGMANN, Abh. Senckenb. Ges. xxiv, figg.: n. spp.
- Pilula*, n. gen. of *Zonitidae* for *Helix prætumida*, Morel.; MARTENS, Mt. Zool. Samml. Mus. Berlin, i, p. 16 [Anatomy by WIEGMANN, *t. c.* pp. 68-71].
- Pseudhelicarion*, n. sect. of *Macrochlamys*, first species *Helix ceratodes*, Pfeiffer; MOELLENDORFF, Abh. Ges. Görlitz, xxii, p. 39.
- Rhysota brookei*, anatomy of; WIEGMANN (515).
- Sesara perroti*, Laos; ANCEY, Bull. Mus. Marseille, i, p. 129, fig.: n. sp.
- Sitala carinifera*, Stol., n. var.; ALDRICH, Nautilus, xii, p. 2, fig.
- Sitala collinae*, Lombock; SMITH, P. Malac. Soc. London, iii, p. 28, fig.:
S. pyramidalis, *operiens*, Ceylon; SYKES, *t. c.* p. 70, figg.: n. spp.
- Sophina trinitaria*, Trinidad; SMITH, J. Conch. ix, p. 27, fig.: n. sp.
- Taxeodonta*, n. subgen. of *Gastrodonta*, first species *G. significans*; PILSBRY, Nautilus, xi, p. 132.
- Thapsia unguinosa*, Eritrea; POLLONERA, Boll. Mus. Torino, xiii, p. 5, fig.: n. sp.
- Trachycystis lignicola*, S. Africa; MELVILL & PONSONBY, Ann. Nat. Hist. ii, p. 125, fig.: n. sp.
- Trichotoxon maculatum*, Uganda; SIMROTH (419), p. 6, fig.: n. sp.
- Trochomorpha paviei*, new var., Laos; ANCEY, Bull. Mus. Marseille, i, p. 131:
T. (Videna) lardea, *bicolor*, *planorbis*, *timorensis*, anatomy of; WIEGMANN (515).
- Trochomorpha dohertyi*, Sumatra; ALDRICH, Nautilus, xii, p. 2, fig.:
T. cerea, p. 73, *decipiens* (Quadr. & M.), p. 74, *sericata*, *pseudosericina* (Bttg. MS.), p. 75, (*Videna*) *nitidella*, (*V.*) *crassula*, p. 77, Philippines; MOELLENDORFF, Abh. Ges. Görlitz, xxii: n. spp.
- Vega*, WestInd., is a synonym of *Mariella*; WEBB (504).
- Vitrea (Crystallus) zapateri*, Spain; WESTERLUND, Ann. Mus. St. Petersb.

- 1898, p. 155: *V. raderi*, Maryland; DALL, Nautilus, xi, p. 100: *V. lunti*, Trinidad; SMITH, J. Conch. ix, p. 27, fig. : n. spp.
- Vitrina humilis*, p. 2, *demissa*, *modesta*, p. 3, Eritrea; POLLONERA, Boll. Mus. Torino, xiii, figg.: *V. holmiensis*, Sweden; WESTERLUND, Acta Soc. Faun. Fenn. xiii, No. 7, p. 32: *V. maroccana*, Morocco; MABILLE, Bull. Soc. Philom. ix, p. 83 : n. spp.
- Vitrinidæ*; MOELLENDORFF, in SEMPER'S Reisen im Arch. Philippinen, Wiss. Result. viii, pp. 34-50.
- Vitrinopsis quadrasi*, Mindoro; MOELLENDORFF in SEMPER'S Reisen im Arch. Philippinen, Wiss. Result. viii, p. 38: n. sp.
- Xesta cincta*, *halmaherica*, anatomy of; WIEGMANN (515).
- Zonites kobelti* (Bttg. MS.), Greece, p. 869, *lardeus* (Stenz MS.), Croatia, p. 883; KOBELT in MARTINI & CHEMNITZ (267), figg.: *Z. cilicicus*, Cilicia; KOBELT, Nachrbl. Deutsch. malak. Ges. 1897, p. 166 : n. spp.
- Zonitoides randolphi*, Alaska; PILSBRY, Nautilus, xii, p. 87: n. sp.

ARIONIDÆ.

- Anadenus altivagus*, anatomy; PILSBRY (340).
- Arionidæ* may be divided into three subfamilies, *Binneyinae*, *Ariolimacinae*, and *Arioninae*; these and their genera discussed and classified; PILSBRY, P. Malac. Soc. London, iii, pp. 94-104: Revision of N. American species of *Anadenulus*, *Binneya*, *Hemphillia*, *Hesperarion*, and *Prophysaon*; PILSBRY & VANATTA, P. Ac. Philad. 1898, pp. 219-261.
- Ariunculus austriacus*, Austria; BABOR, P. Malac. Soc. London, iii, p. 156: n. sp.

ENDODONTIDÆ.

- Charopa delectans*, New Guinea; SMITH, P. Malac. Soc. London, iii, p. 33, fig.: n. sp.
- Philalanka*, n. subgen. of *Endodonta* for *P. secessa*, n. sp., Ceylon, p. 11, *bolampattiensis*, n. sp., S. India, p. 13; GODWIN-AUSTEN, P. Malac. Soc. London, iii, figg.
- Punctum clappi*, Washington and Oregon, p. 133, *californicum*, California, p. 124; PILSBRY, Nautilus, xi : n. spp.
- Pyramidula strigosa* found with young in oviduct; ROBERTS, *op. cit.* xii, p. 24: *P. striatella*, n. var.; PILSBRY, *t. c.* p. 86.
- Pyramidula cockerelli*, Colorado and New Mexico; PILSBRY, *t. c.* p. 85: n. sp.

HELICIDÆ.

- Anatomy of several Japanese Helices; JACOBI (199).
- Albersia pubicepa*, anatomy of; WIEGMANN (515).
- Brazieria*, notes on; ANCEY, Bull. Mus. Marseille, i, p. 148.
- Camæna suprafusca*, Annam; MOELLENDORFF, Nachrbl. Deutsch. malak. Ges. 1898, p. 71: n. sp.
- Campylæa faustina*, new variety of; MOELLENDORFF, *t. c.* p. 4.
- Campylæa (Dinarica) moratschensis*, Montenegro; KOBELT, *t. c.* p. 161: n. sp.
- Chloræa unifasciata*, Philippines; MOELLENDORFF, Abh. Ges. Görlitz, xxii, p. 99: n. sp.
- Chloritis fultoni*, Philippines; MOELLENDORFF, *t. c.* p. 95: *C. microtrichia*, p. 71, *diplochone*, p. 72, Annam; MOELLENDORFF, Nachrbl. Deutsch. malak. Ges. 1898: *C. moellendorffi*, Tuom; ANCEY, P. Linn. Soc. N. S. Wales, xxii, p. 773, fig.: *C. simbangensis*, German New Guinea; KOBELT, Nachrbl. Deutsch. malak. Ges. 1898, p. 93: n. spp.
- Cochlostyla ovoidea*, variation of; SUMNER, Tr. New York Ac. xv, p. 137.

- Cochlostyla metallorum*, p. 110, *heermanni*, p. 119, *martensi*, p. 123, *rollei*, p. 146, Philippines; MOELLENDORFF, Abh. Ges. Görlitz, xxii : n. spp.
- Dendrotrachus conicoides*, anatomy of; WIEGMANN (515).
- Dorcasia (Tulbaghinia) isomerioides*, S. Africa; MELVILL & PONSONBY, Ann. Nat. Hist. i, p. 28, fig.: n. sp.
- Dryocochlias*, n. sect. of *Cochlostyla*, type *Helix metaformis*, Fér.; MOELLENDORFF, Abh. Ges. Görlitz, xxii, p. 124.
- Epiphragmophora*, anatomy of some species of; PILSBRY & VANATTA, P. Ac. Philad. 1898, p. 68: *E. arrosa* and *E. tudiculata*, new varieties of; PILSBRY, Nautilus, xii, p. 22.
- Euomphalia (?) floerickei*, Montenegro; KOBELT, Nachrbl. Deutsch. malak. Ges. 1898, p. 162: n. sp.
- Fruticicola assaortina*, Eritrea; POLLONERA, Boll. Mus. Torino, xiii, p. 9, fig.: n. sp.
- Helix zelebori*, new variety; BRANCSIK, Jahresh. Ver. Trencsin, xix, p. 86: *H. nemoralis*, variation of; HOWE, Amer. Natural. xxxii, p. 913: *H. catocyphia*, Bourg. = *H. pisana*; PALLARY (325, 226): *H. terrestris*, note on varieties of; WRIGHT, J. Conch. ix, p. 58: *H. agardhi*, n. n. for *H. ponsonbyi*, West. non Kobelt = *H. ponsonbyana*, Pilsbry, p. 70; *H. ia*, n. n. for *H. richardi*, Kobelt non Fér., p. 78; *H. emmae*, n. n. for *H. heynemanni*, Kobelt non Pfeiffer, p. 88; PALLARY, J. Conchyl. xlv: *H. nemoralis*, monstrosity of; PLANETH (360): *H. conoidea*, n. var. of; PALLARY, C.R. Ass. France, 1897, p. 559, fig.: *H. (Eulotella) similis*, (*Stylodon*) *studeriana*, anatomy; WIEGMANN (263), pp. 72-77: *H. vermiculata*, note on; MADOULÉ (254): *H. nemoralis*, note on; MADOULÉ (254): *H. candicans*, note on distribution of; REIBISCH, SB. Ges. Isis, 1898, p. 4: *H. montserratensis*, note on; BOFILL y POCH (52).
- Helix (Trichia) corasia*, Sweden; WESTERLUND, Acta Soc. Faun. Fenn. xiii, No. 7, p. 50: *H. (Gonostoma) alinae*, p. 68, (*Fruticicola*) *alsiella*, p. 69, (*Xerophila*) *cherifiana*, p. 75, (*X.*) *paulinae*, p. 78, (*X.*) *ahmedi*, p. 80, (*X.*) *chadiana*, p. 87, (*X.*) *sublallementiana*, p. 88, (*X.*) *welschi*, p. 91, (*X.*) *melillensis*, p. 92, (*Iberus*) *olcese*, p. 99, Morocco, (*Macularia*) *lariollei*, p. 113, Morocco and Algeria, (*M.*) *aida*, p. 119, Algeria; PALLARY, J. Conchyl. xlv, figg.: *H. (Vallonia) extrema*, Russia, (*Gonostoma*) *negropontina*, Greece, p. 156, (*Latonia*) *malleolata*, Syria, (*Theba*) *seductilis*, Turkestan, (*Monacha*) *scharffi*, Corsica, p. 157, (*Fruticocampylaea*) *aliostoma*, Transcaucasia, (*Eucampylaea*) *indigena*, Turkestan, p. 158, (*E.*) *angulosa*, Greece, (*E.*) *palmeni*, p. 159, (*E.*) *scythica*, Turkestan, p. 160, (*E.*) *matrella*, Asia Minor, (*E.*) *opposita*, Turkestan, p. 161, (*Levantina*) *casta*, Caucasus, p. 162, (*Pomatia*) *stenroosi*, Turkestan, p. 163; WESTERLUND, Ann. Mus. St. Petersburg. 1898: *H. tachypopta* (Bourgn. MS.), Algeria; PALLARY, J. Conchyl. xlv, p. 167: *H. (Papuina) piliscus*, p. 160, (*Albersia*) *obiensis*, p. 161, Obi; MARTENS, SB. Ges. naturf. Berlin, 1898: *H. (Macularia) kebiri-ana* (Pallary MS.), Algeria, p. 42, (*Xerophila*) *buslimiana* (Pollonera MS.), Tripoli, p. 44, (*Vallonia*) *saxoniana*, Gotha, p. 55; KOBELT in ROSSMAESSLER (394), figg.: *H. (Pomatia) escherichi*, Asia Minor; BOETTGER, Nachrbl. Deutsch. malak. Ges. 1898, p. 12: *H. mesquiniana*, p. 558, Algeria, *prælongata*, p. 560, Morocco, *microzaffarina*, p. 561, Algeria; PALLARY, C.R. Ass. France, 1897, figg.: *H. (Camæna?) billeti*, p. 316, (*Plectotropis?*) *bonnierii*, p. 319, (*Plectopylis*) *giardi*, p. 320, Tonkin; FISCHER, Bull. Sci. France Belgique, xxviii, figg.: *H. (Caracolina) probata*, p. 84, (*Xerophila*) *submæsta*, (*X.*) *psammicola*, p. 87, (*X.*) *bucheti*, p. 88, Morocco, (*Iberus*) *palmicola*, p. 97, (*Xerophila*) *visabunda*, p. 98, Canaries; MABILLE, Bull. Soc. Philom. ix: *H. disparilis*, hab. unknown; ANCEY, Nautilus, xii, p. 21: n. spp.
- Jacosta andrewi*, Cyprus; ROLLE, Nachrbl. Deutsch. malak. Ges. 1898, p. 165: n. sp.

- Leucochroa pallaryi*, Deb. MS., Algeria; PALLARY, C.R. Ass. France, 1897, p. 556, fig.: n. sp.
- Obbina hemiodon*, Philippines; MOELLENDORFF, Abh. Ges. Görlitz, xxii, p. 84: n. sp.
- Papuina vitrea*, anatomy of; WIEGMANN (515).
- Phania kükenhali*, anatomy of; WIEGMANN (515).
- Planispira exceptiuncula*, *expansa*, *scheepmakeri*, *surrecta*, *zonalis*, *loxotropis*, anatomy of; WIEGMANN (515).
- Planispira simbangensis*, German New Guinea; KOBELT, Nachrbl. Deutsch. malak. Ges. 1898, p. 92: *P. aldrichi*, Enganio I.; HENDERSON, Nautilus, xii, p. 15, fig.: *P. dulcissima*, North Borneo; SMITH, P. Malac. Soc. London, iii, p. 33, fig.: n. spp.
- Plectopylis trochospira*, new variety of; GUDE, Sci. Gossip, iv, p. 285: *P. achatina*, pp. 115, 133–135, *linteræ*, p. 170, new varieties of; GUDE, l. c. v: Several descriptions reprinted; GUDE, J. Malac. vii, pp. 7–16.
- Plectopylis leucochilus*, *perrieræ*, Burma, p. 231, *blanda*, Assam, p. 264; GUDE, Sci. Gossip, iv, figg.: *P. cairnsi*, Burma (?); GUDE, l. c. v, p. 170, fig.: *P. (Sykesia) caliginosa*, Ceylon; SYKES, P. Malac. Soc. London, iii, p. 72, fig.: n. spp.
- Polygyra tridentata*, new varieties; BAKER, Tr. Ac. St Louis, viii, pp. 84 & 85: *P. lawæ* and *P. tridentata*, new varieties of; PILSBRY, Nautilus, xii, p. 22: *P. rhyssa*, new var.; COCKERELL, t. c. p. 77.
- Polygyra altissima*, New Mexico; COCKERELL, t. c. p. 76: *P. miorhyssa*, New Mexico; DALL, t. c. p. 75: n. spp.
- Pomatia dormitoris*, p. 163, *kolaschinensis*, *vladika*, p. 164, Montenegro; KOBELT, Nachrbl. Deutsch. malak. Ges. 1898: *P. pelagonesica*, Greece; ROLLE, t. c. p. 91: n. spp.
- Pseudobba quoyi*, anatomy of; WIEGMANN (515).
- Pupisoma circumlitum*, Queensland; HEDLEY, Rec. Austral. Mus. iii (1897), p. 44, fig.: n. sp. [inserted by error with *Cyclophoridae* last year].
- Sulcobasis leptocochlea*, German New Guinea; ANCEY, P. Linn. Soc. N. S. Wales, xxii, p. 772, fig.: n. sp.
- Thysanota (?) eumita*, Ceylon; SYKES, P. Malac. Soc. London, iii, p. 72, fig.: *T. hispida*, Ceylon; SYKES, t. c. p. 160, fig.: n. spp.
- Trachia froggatti*, *orthocheila*, p. 774, *monogramma*, p. 775, N.W. Australia; ANCEY, P. Linn. Soc. N. S. Wales, xxii, figg.: n. spp.
- Trishoplita*, n. gen. for *H. pallens* and *H. goodwini*; JACOBI, J. Coll. Japan, xii, p. 65.
- Tulbaghinia*, n. subgen. of *Dorcasia* for *D. isomerioides*, n. sp., S. Africa; MELVILL & PONSONBY, Ann. Nat. Hist. i, p. 28, fig.

BULIMIDÆ, BULIMULIDÆ, and ORTHALICIDÆ.

- Amphidromus porcellanus*, *sinistralis*, anatomy of; WIEGMANN (515).
- Amphidromus hæmatostoma*, Annam; MOELLENDORFF, Nachrbl. Deutsch. malak. Ges. 1898, p. 74: *A. inconstans*, Alor Island; FULTON, P. Malac. Soc. London, iii, p. 10, fig.: *A. laosianus*, Upper Mekong; BAVAY, J. Conchyl. xlv, p. 15, fig.: n. spp.
- Bulimulus spirifer*, new variety of; PILSBRY in TRYON (489), xi, p. 159.
- Bulimulus (Drymæus) plicato-liratus*, Bogota, *hidalgoi*, Ecuador, p. 80, *smithii*, Bogota, *ziczac*, *caucaensis*, Colombia, p. 81, *malleatus*, Bolivia, *lucidus* [renamed *dacostianus*; PILSBRY in TRYON (489), xi, p. 219], *tigrinus*, Ecuador, p. 82; DA COSTA, P. Malac. Soc. London, iii, figg.: n. spp.
- Drymæus expansus*, p. 223, *strigatus*, p. 230, *decoratus*, p. 262, *nigrofasciatus*, p. 307, *navicula*, p. 320, new varieties of; PILSBRY in TRYON (489),

- xi: *D. leai*, n. n. for *Bulimus gracilis*, Lea non Hutton, p. 213, *dacostianus*, n. n. for *D. lucidus*, Da Costa non Reeve, p. 219, *libertadensis*, n. n. for *Bulimus taeniatus*, Phil. non Mörch, p. 291, *semimaculatus*, n. n. for *B. maculatus*, Lea non Brug., p. 297, *pertristis*, n. n. for *B. tristis*, Pfr. non Jay, p. 301; PILSBRY in TRYON (489), xi.
- Drymaeus uranops*, Brazil, p. 188, *fordii*, hab. unknown, p. 205, *subsimilaris*, hab. incert., p. 222, *blandi*, p. 248, *fresnoensis*, Colombia, p. 304; PILSBRY in TRYON (489), xi, figg.: *D. andai*, Ecuador; JOUSSEAUME, Naturaliste, 1898, p. 14 : n. spp.
- Hamadryas rabuti*, Ecuador; JOUSSEAUME, Naturaliste, 1898, p. 14, fig.: n. sp.
- Moricandia*, Pilsbry & Vanatta, n. subgen. of *Odontostomus*, type *O. fusiformis*, Rang; PILSBRY, Nautilus, xii, p. 57.
- Neopetræus tessellatus*, p. 169, *arboriferus*, p. 176, *decussatus*, p. 179, *cærulescens*, p. 180, new varieties of; PILSBRY in TRYON (489), xi.
- Neopetræus vadum*, p. 165, *arboriferus*, p. 175, Peru; PILSBRY in TRYON (489), xi, figg. : n. spp.
- Odontostomus*, note on genus; PILSBRY, Nautilus, xii, p. 57.
- Odontostomus* (*Macrodontes*) *paulista*, Pilsbry & Ihering, p. 471, (*M.*) *dautzenbergianus*, p. 472, (*M.*) *degeneratus*, Brazil, (*Plagiodontes*) *iheringi*, Pilsbry & Vanatta, Argentina, p. 473; PILSBRY, P. Ac. Philad. 1898 : n. spp.
- Placostylus remotus*, British New Guinea; HEDLEY, P. Linn. Soc. N. S. Wales, xxiii, p. 97, fig. : n. sp.
- Pseudopartula*, notes on; ANCEY, Bull. Mus. Marseille, i, p. 147.
- Spixia*, Pilsbry & Vanatta, n. subgen. of *Odontostomus*, type *O. spixii*, Pfr.; PILSBRY, Nautilus, xii, p. 57.
- Strophocheilus* (*Eurytus*) *subirroratus*, p. 83, *doliarius*, p. 84, Ecuador; DA COSTA, P. Malac. Soc. London, iii, figg. : n. spp.

BULIMINIDÆ, CYLINDRELLIDÆ, and PUPIDÆ.

- Amphicosmia*, n. sect. of *Urocoptis*, type *U. salleana*, Pfr.; PILSBRY & VANATTA, P. Ac. Philad. 1898, p. 277.
- Arangia*, n. subgen. of *Urocoptis*, type *U. sowerbiana*, Pfr.; PILSBRY & VANATTA, t. c. p. 275.
- † *Baboria*, n. n. for *Cossmannia*, Babor non Newton; COSSMANN, Rev. Paleozool. ii, p. 57.
- Bifidaria perversa*, p. 90, *dalliana*, p. 91, Arizona; STERKI, Nautilus, xii: *B. ashmuni*, Arizona and New Mexico; STERKI, t. c. p. 49 : n. spp.
- Bothriopupa*, n. sect. of *Vertigo*, type *V. variolosa*; PILSBRY, Nautilus, xi, p. 119.
- Buliminus reinianus*, anatomy of; JACOBI (199): Notes on species with new varieties of *B. limbodentatus*, *nucifragus*, and *halepensis*; BOETTGER, Nachrbl. Deutsch. malak. Ges. 1898, pp. 19–27: *B. (Pachnodes) ornatus* and *fulvicans*, anatomy; WIEGMANN (263), pp. 81–85: *B. (Napæus) moellendorffi*, new variety; GREDLER (161), p. 42, fig.
- Buliminus* (*Brephulus*) *kasnakowi*, p. 163, (*B.*) *otostomus*, (*Chondrulus*) *bisinuatus*, p. 164, Turkestan; WESTERLUND, Ann. Mus. St Petersburg. 1898: *B. (Rachis) aldabre*, Aldabra Island; MARTENS, Mt. Zool. Samml. Mus. Berlin, i, p. 28, fig. [see also SMITH, P. Malac. Soc. London, iii, p. 33]: *B. (Chondrulus) foveicollis*, Asia Minor; BOETTGER, Nachrbl. Deutsch. malak. Ges. 1898, p. 14: *B. (Zebrinus) oligogyrus*, Syria, p. 20, (*Z.*) *funkei*, Asia Minor, p. 22, (*Petræus*) *naegelei*, Syria, p. 25; BOETTGER, t. c.: *B. (Petræus) boccardi*, Eritrea; POLLONERA, Boll. Mus. Torino, xiii, p. 7, fig.: *B. zuluensis*, S. Africa; MELVILL & PONSONBY, Ann. Nat. Hist. ii, p. 127, fig.: *B. pupopsis*, p. 104,

- hyacinthi*, p. 105, *rhabdites*, p. 106, China; GREGLER, Nachrbl. Deutsch. malak. Ges. 1898 [also, with figg., in IDEM (161)]: n. spp.
- Bulinus* [is a *Buliminus*] *severus*, Canaries; MABILLE, Bull. Soc. Philom. ix: n. sp.
- Cerion torrei* (Blanes), p. 476, *sueyrasi* (Blanes), *crassiusculum* (Torre), p. 477, *sanzi* (Blanes), p. 478, Cuba; PILSBRY & VANATTA, P. Ac. Philad. 1898, figg.: n. spp.
- Clausilia succineata*, new variety; BRANCSIK, Jahresh. Ver. Trencsin, xix, p. 88: *C. schweinfurthi*, note on; BOETTGER, Nachrbl. Deutsch. malak. Ges. 1898, p. 63.
- Clausilia* (*Hemiphaedusa*) *bolovenica*, (*Garnieria*) *rugifera*, Annam; MOEL-LENDORFF, Nachrbl. Deutsch. malak. Ges. 1898, p. 76: *C. giardi*, p. 323, *billeti*, p. 324, *houssayi*, p. 325, Tonkin; FISCHER, Bull. Sci. France Belgique, xxviii, figg.: *C. (Medora) clissana*, Dalmatia; BRANCSIK, Jahresh. Ver. Trencsin, xix, p. 87, fig.: *C. (Clausiliastra) clavella*, Greece, p. 166, (*Euxina*) *plusia*, Asia Minor, p. 167, (*Alinda*) *remutata*, Macedonia, (*Albinaria*) *argynnis*, p. 168, (*Delima*) *feriata*, Greece, (*D.*) *porcellanea*, p. 169, (*D.*) *solitaria*, Dalmatia, (*D.*) *neutra*, Greece, p. 170, (*Albinaria*) *plicicollis*, Crete, (*A.*) *theobaldi*, Greece, p. 171, (*A.*) *nestor*, Dalmatia, (*A.*) *immersa*, Greece, p. 172, *hereditaria*, p. 174, *relicta*, p. 175, hab. unknown; WESTERLUND, Ann. Mus. St Petersburg. 1898: *C. timalthea*, p. 63, *labyrinthoides*, p. 64, Che-Kiang; SYKES, P. Malac. Soc. London, iii, figg.: n. spp.
- Cochlodinella*, n. sect. of *Urocoptis*, type *U. poeyana*, D'Orb.; PILSBRY & VANATTA, P. Ac. Philad. 1898, p. 274.
- +*Cossmannia*, n. subsect. of *Clausilia* for *C. slaviki*, n. sp., Tertiary of Bohemia; BABOR, SB. Böhmisch. Ges. 1897, No. lxiii, p. 10 [renamed *Baboria*, q. v.].
- Cylindrellidae*, name replaced by *Urocoptidae*, with lists of genera and species; PILSBRY & VANATTA, P. Ac. Philad. 1898, pp. 264-286.
- Esochara*, n. sect. of *Urocoptis*, type *U. strangulata*, Poey; PILSBRY & VANATTA, P. Ac. Philad. 1898, p. 276.
- Geoscala*, n. sect. of *Brachypodella*, type *B. seminuda*, C. B. Ad.; PILSBRY & VANATTA, t. c. p. 279.
- Haplopupa*, n. sect. of *Vertigo*, type *Vertigo dalliana*, Sterki; PILSBRY, Nautilus, xi, p. 119.
- Holospira claviformis*, Martens, is a synonym of *H. elizabethæ*; PILSBRY, t. c. xii, p. 12.
- Idiostemma*, n. subgen. of *Urocoptis*, type *U. uncata*, Gundl.; PILSBRY & VANATTA, P. Ac. Philad. 1898, p. 275.
- Longidens*, n. subgen. of *Strophia*, type *S. pannosa*; MAYNARD, Contrib. to Science, iii, p. 39.
- Maceo*, n. sect. of *Urocoptis*, for *U. interrupta*, Gundl.; PILSBRY & VANATTA, P. Ac. Philad. 1898, p. 275.
- Macroceramus texanus*, Texas, *floridanus*, Florida; PILSBRY, Nautilus, xii, p. 23: n. spp.
- Microceramus*, n. sect. of *Macroceramus*, type *M. floridanus*, Pils.; PILSBRY & VANATTA, P. Ac. Philad. 1898, p. 281 [see also PILSBRY, Nautilus, xi, p. 107].
- Napæus vincentii*, China; GREGLER, Nachrbl. Deutsch. malak. Ges. 1898, p. 104 [also as *Buliminus (Napæus)*; IDEM (161), p. 43, fig.]: n. sp.
- Nenia subarcuata*, Spain; BOFILL Y POCH, Bol. Ac. Barcelona, i, p. 366, fig.: n. sp.
- Pineria bonairensis*, Bonaire, near Curaçoa; SMITH, P. Malac. Soc. iii, p. 114, fig.: n. sp.
- Pinguitia*, n. subgen. of *Strophia*, type *S. dimidiata*, Pfr.; MAYNARD, Contrib. to Science, iii, p. 30.
- Pupa farquhari*, S. Africa; MELVILL & PONSONBY, Ann. Nat. Hist. ii,

- p. 128, fig.: *P. (Torquilla) profuga*, Transcaspia, (*Modicella*) *gratiosa*, Spain, p. 165, (*Vertigo*) *regularis*, Turkestan, p. 166; WESTERLUND, Ann. Mus. St. Petersb. 1898: *P. (Alaea) dicæa*, p. 64, *gemma*, p. 65, *eremia*, p. 67, *callista*, p. 72, (*Vertilla*) *erlandi*, p. 194, Sweden; WESTERLUND, Acta Soc. Faun. Fenn. xiii: *P. microscopica* (Nevill MS.), Seychelles; MARTENS, Mt. Zool. Samml. Mus. Berlin, i, p. 25, fig.: n. spp.
- Pupidæ*, notes on some North American species; COCKERELL, Nautilus, xi, p. 136.
- Pycnoptychia*, n. sect. of *Urocoptis*, type *U. humboldtiana*, Pfr.; PILSBRY & VANATTA, P. Ac. Philad. 1898, p. 275.
- Resupinata*, new "group" for *Eucalodium speciosum*, *edwardsianum*, etc.; MARTENS, Biol. Centr. Amer. p. 255.
- Sectilumen*, n. sect. of *Urocoptis*, for *U. ornata*, Gundl.; PILSBRY & VANATTA, P. Ac. Philad. 1898, p. 276.
- Seniculus*, n. subgen. of *Strophia*, type *S. mumia*, Brug.; MAYNARD, Contrib. to Science, iii, p. 17.
- Serina*, n. gen. of *Buliminidæ* for *S. ser*, n. sp.; GREDLER, Nachrbl. Deutsch. malak. Ges. 1898, p. 106 [also IDEM (161), p. 48].
- Serina cathaica*, p. 106, *ser*, *subser*, p. 107, China; GREDLER, t. c. [also, with figg. IDEM (161)]: n. spp.
- Spiroceramus*, n. sect. of *Macroceramus*, type *M. amplus*, Guild.; PILSBRY & VANATTA, P. Ac. Philad. 1898, p. 281.
- Spirostemma*, n. sect. of *Urocoptis*, type *U. rubra*, C. B. Ad.; PILSBRY & VANATTA, P. Ac. Philad. 1898, p. 275.
- Stereophædusa*, anatomy of; JACOBI (199).
- Sterkia*, n. subgen. of *Pupa*, first species *Pupa calamitosa*, Pils.; PILSBRY, Nautilus, xi, p. 119.
- Strophia scripta*, p. 3, *fastigata*, p. 6, *eurystoma*, p. 7, (*Seniculus*, n. subgen.) *media*, p. 18, Cuba, (*S.*) *ferruginea*, p. 19, Hayti, (*S.*) *obscura*, p. 21, (*Umbonis*, n. subgen.) *faxoni*, p. 32, Cuba, *cylindrica*, p. 34, Bahamas; MAYNARD, Contrib. to Science, iii, figg.: n. spp.
- Teneritia*, n. sect. of *Berendtia*, type *B. digueti*, Mab.; MABILLE, Bull. Soc. Philom. ix, p. 79: is a synonym of *Spartocentrum*, Dall; PILSBRY & VANATTA, P. Ac. Philad. 1898, p. 283.
- Tornelasmus*, n. sect. of *Urocoptis*, type *U. torquata*, Morel.; PILSBRY & VANATTA, t. c. p. 276.
- Tridentistrophia*, n. subgen. of *Strophia*, type *S. striatella*, Fér.; MAYNARD, Contrib. to Science, iii, p. 9.
- Umbonis*, n. subgen. of *Strophia*, type *S. scalarina*, Pfr. and Gundl.; MAYNARD, t. c. p. 28.
- Urocoptis*, Beck, replaces *Cylindrella*, Pfr., review of this and allied genera with new sections and list of species; PILSBRY & VANATTA, P. Ac. Philad. 1898, pp. 264–286.
- Zebrina schalfewi*, China; GREDLER, Nachrbl. Deutsch. malak. Ges. 1898, p. 105 [also, with fig., as *Buliminus (Zebrina)*, IDEM (161)]: n. sp.

STENOGYRIDÆ and ACHATINELLIDÆ.

- Achatina panthera*, anatomy; WIEGMANN (263), pp. 85–90.
- Achatina rugosa*, *sylvatica*, Congo Free State; PUTZEYS, Pr.-verb. malac. Belgique, xxvii, p. xc, figg.: *A. rhabdota*, S. Africa; MELVILL & PONSONBY, Ann. Nat. Hist. i, p. 29, fig.: n. spp.
- Bulimus [Rumina] decollatus*, cerebral ganglia in; NABIAS, C.R. Soc. Bordeaux, 1896, p. lxi: *B. decollatus*, note on; MADOUÉ (254).
- Cæcilianella (Aciculina) præclara*, Turkestan; WESTERLUND, Ann. Mus. St. Petersb. 1898, p. 176: n. sp.

- Cionella* (*Ferussacia*) *agilis*, Algiers; WESTERLUND, *t. c.* p. 175: n. sp.
Ferussacia moreleti, n. n. for *F. forbesi*, Morelet non B.; PALLARY, J. Conchyl. xvi, p. 123.
Ganomidos, d'Ailly (*confer.* Zool. Rec., Moll. xxxiv, p. 56), is a synonym of *Callistopepla*, Ancey; ANCEY, Nautilus, xii, p. 92.
Ganomidos pellucidus, Congo Free State; PUTZEYS, Pr.-verb. malac. Belgique, xxvii, p. xci, fig.: n. sp.
Glessula collettae, Ceylon; SYKES, P. Malac. Soc. London, iii, p. 73, fig.: n. sp.
Hapalus braueri, Seychelles; MARTENS, Mt. Zool. Samml. Mus. Berlin, i, p. 24, fig.: *H. globosus*, S. Africa; MELVILL & PONSONBY, Ann. Nat. Hist. ii, p. 128, fig.: n. spp.
Leptinaria stollii, p. 316, Guatemala, *pittieri*, p. 317, *crenulata*, p. 318, *biolleyi*, p. 319, *costaricana*, p. 320, *hapaloides*, *ambigua*, *solida*, p. 321, *convoluta*, p. 322, Costa Rica, *exigua*, p. 318, Mexico, *sinistra*, p. 319, Nicaragua; MARTENS, Biol. Centr.-Amer., figg.: n. spp.
Limicolaria wathenensis, *paludosa*, p. iv, *distincta*, *congolana*, p. v, Congo; PUTZEYS, Pr.-verb. malac. Belgique, xxvii, figg.: n. spp.
Livinhacia dupuisi, Congo Free State; PUTZEYS, *t. c.* p. lxxxix, fig.: n. sp.
Luntia, n. gen. of *Stenogyridæ* for *L. insignis*, n. sp., Trinidad; SMITH, J. Conch. ix, p. 28, fig.
Neosubulina harterti, n. gen. and sp. (*Stenogyridæ*), Bonaire, near Curaçoa; SMITH, P. Malac. Soc. London, iii, p. 115, fig.
Opeas prestoni, Ceylon; SYKES, *t. c.* p. 73, fig.: n. sp.
Perideriopsis umbilicata, n. gen. and sp., Congo; PUTZEYS, Pr.-verb. malac. Belgique, xxvii, p. vi, fig.
Prosopeas argentea, Enganio I.; HENDERSON, Nautilus, xii, p. 16, fig.: n. sp.
Pseudoglessula (?) *phaea*, Congo Free State; PUTZEYS, Pr.-verb. malac. Belgique, xxvii, p. xcii, fig.: n. sp.
Pseudosubulina robusta, S.W. Mexico, *fortis*, *mitescens*, W. Guatemala, p. 304, *salvini*, N. Guatemala, p. 305; MARTENS, Biol. Centr.-Amer. figg.: n. spp.
Ravenia hollandi, Jamaica; HENDERSON, Nautilus, xii, p. 25, fig.: n. sp.
Spiraxis scalella, Costa Rica; MARTENS, Biol. Centr.-Amer. p. 311, fig.: n. sp.
Stenogyra (*Spiraxis*) *virescens*, Colombia; DA COSTA, P. Malac. Soc. London, iii, p. 82, fig.: *S. henrici*, Laos; ANCEY, Bull. Mus. Marseille, i, p. 134, fig.: *S. lombockensis*, Lombock; SMITH, P. Malac. Soc. London, iii, p. 29, fig.: n. spp.
Subulina octona, anatomy; WIEGMANN (263), pp. 91 & 92.
Subulina (*Nothus*) *soror*, Lombock; SMITH, P. Malac. Soc. London, iii, p. 30, fig.: *S. stollii*, N. Guatemala, *porrecta*, S.E. Mexico; MARTENS, Biol. Centr.-Amer. p. 300, figg.: n. spp.
Tornatellina citrea, Lombock; SMITH, P. Malac. Soc. London, iii, p. 30, fig.: *T. pittieri*, Cocos Island, S. America; MARTENS, SB. Ges. naturf. Berlin, 1898, p. 157: n. spp.
Tornaxis, n. gen. for *T. singularis*, n. sp., Guatemala; MARTENS, Biol. Centr.-Amer. p. 311, fig.

SUCCINEIDÆ, ATHORACOPHORIDÆ, VAGINULIDÆ, and
 VERONICELLIDÆ.

- Aneitella berghi*, New Britain (Neu-Pommern); PLATE, Zool. Jahrb. (Anat.) xi, p. 194, fig.: n. sp. [not new: cf. Zool. Rec. xxxiv, p. 56].
Janella schauinslandi, Stephens I., New Zealand; PLATE, *t. c.* p. 193, fig.: n. sp. [not new: cf. Zool. Rec. xxxiv, p. 56].

Janullidæ, anatomy of; PLATE (362).

Onchidiella, anatomy of; WISSEL (520).

Onchidiella juan-fernandeziana; Juan Fernandez I.; WISELL, Zool. Jahrb. Suppl. iv, p. 586, fig.: n. sp.

Succinea horticola, anatomy of; JACOBI (199).

Succinea costaricana, p. 338, Costa Rica, *ampullacea*, p. 340, Mexico; MARTENS, Biol. Centr.-Amer., figg.: *S. tingitana*, Morocco; PALLARY, J. Conchyl. xlv, p. 125, fig.: *S. mcgregori*, Clarion Island; PILSBRY, P. Ac. Philad. 1898, p. 354, fig.: *S. globispira*, Cocos Island, S. America; MARTENS, SB. Ges. naturf. Berlin, 1898, p. 158: *S. borealis*, Sweden; WESTERLUND, Acta Soc. Faun. Fenn. xiii, p. 89: *S. piscinalis*, S. Africa; MELVILL & PONSONBY, Ann. Nat. Hist. ii, p. 127, fig.: n. spp.

Triboniophorus graeffei, anatomy of; PFEIFFER (338).

Vaginula striata, *substriata*, p. 16, *obscura*, p. 17, *æquatorialis*, *decipiens*, p. 18, E. Central Africa; SIMROTH (419), figg.: n. spp.

Vaginulidæ of E. Africa and adjacent Islands; SIMROTH (419).

Veronicella stollii, Guatemala; MARTENS, Biol. Centr.-Amer. p. 351, fig.: n. sp.

BASOMMATOPHORA.

AURICULIDÆ, LIMNÆIDÆ, and PHYSIDÆ.

Alampetis, n. subgen. of *Physa* for *P. berendti*, etc.; MARTENS, Biol. Centr.-Amer. p. 368.

Ancylus (*Ancylastrum*) *præstans*, Spain; WESTERLUND, Ann. Mus. St. Petersb. 1898, p. 178: *A. danicus*, Denmark; WESTERLUND, Acta Soc. Faun. Fenn. xiii, p. 128: n. spp.

Auriculacea, monograph re-commenced by KOBELT in MARTINI & CHEMNITZ (267).

Carychium loheri, Philippines; MOELLENDORFF, Nachrbl. Deutsch. malak. Ges. 1898, p. 9: n. sp.

Isidora callosa, Celebes; SARASIN (402), p. 79, fig.: n. sp.

Limnæa truncatula, habits of; BROCKMEIER (65, 66): *L. peregra*, new variety; BRANCSIK, Jahresh. Ver. Trencsin, xix, p. 89: *L. okinawensis*, anatomy of; JACOBI (199): *L. peregra*, notes on: COCKERELL (85).

Limnæa maroccana, Morocco; PALLARY, J. Conchyl. xlv, p. 128, fig.: *L. (Fossaria) præcellens*, N. America; WESTERLUND, Ann. Mus. St. Petersb. 1898, p. 177: *L. (Radix) quadrasi*, Philippines; MOELLENDORFF, Nachrbl. Deutsch. malak. Ges. 1898, p. 10: n. spp.

Melampus phæostylus, Macau; KOBELT in MARTINI & CHEMNITZ (267), p. 218, fig.: n. sp.

Micromelampus, n. sect. of *Melampus*, first species *M. nucleolus*, Mart.; MOELLENDORFF, Abh. Ges. Görlitz, xxii, p. 165.

Physa gradata, S. Africa; MELVILL & PONSONBY, Ann. Nat. Hist. ii, p. 129, fig.: n. sp.

Planorbis, sinistral character of; BAKER, J. Cincinnati Soc. xix, p. 45: *P. spirorbis*, monstrosities of; STUBBS, J. Conch. ix, p. 106.

Planorbis (*Spirodiscus*) *scoliostoma*, Greece, p. 177, (*Gyraulus*) *centralis*, Turkestan, p. 178; WESTERLUND, Ann. Mus. St. Petersb. 1898: *P. annulatus*, Morocco; PALLARY, J. Conchyl. xlv, p. 130, fig.: *P. cryptomphalus*, Denmark, p. 113, *correctus*, Finland, p. 124, *cochlearis*, *gelidus*, Sweden, p. 125; WESTERLUND, Acta Soc. Faun. Fenn. xiii: n. spp.

Planorbula boccardi, Eritrea; POLLONERA, Boll. Mus. Torino, xiii, p. 11, fig.: n. sp.

- Pyrgophysa nyangweensis*, Congo ; PUTZEYS, Pr.-Verb. malac. Belgique, xxvii, p. vi, fig.: n. sp.
Stenophysa, n. subgen. of *Physa* for *C. princeps*, etc. ; MARTENS, Biol. Centr.-Amer. p. 362.

SIPHONARIIDÆ.

- †*Brunonia*, n. g., type *B. grandis*, n. sp., from the Lower Senonian of Brunswick ; MÜLLER, Abh. Preuss. geol. Landes. N. F., Hft. 25, p. 131.
 †*Pseudohercynella*, n. g., for *P. rara*, n. sp. from the Maestricht Chalk ; KAUNHOWEN, Pal. Abh. viii, p. 113.
Siphonaria milne-edwardsi, Cape Verdes ; LOCARD (243), p. 99, fig.: n. sp.

OPISTHOBRANCHIATA.

- Pseudonerinea* belongs, from the protoconch, to the Opisthobranchs ; BIGOT, Bull. Soc. Normand. x, p. xxxi.

NUDIBRANCHIATA.

- Anisodoris*, n. gen., p. 508, for *A. marmorata*, p. 515, *tessellata*, p. 518, Chili ; BERGH, Zool. Jahrb. Supp. iv, figg. : n. spp.
Archidoris rubescens, p. 501, *incerta*, p. 504, Chili ; BERGH, t. c., figg. : n. spp.
Candiella australis, Chili ; BERGH, t. c. p. 536, fig.: n. sp.
Chromodoris juvenca, Chili ; BERGH, t. c. p. 531, fig.: n. sp.
Cratena cavanca, p. 545, *pusilla*, p. 547, Chili ; BERGH, t. c., figg. : n. spp.
Eolis papillosa, habits of ; BOUTAN, Arch. Zool. exp. vi, p. xxxvii.
Euplocamus maculatus, Chili ; BERGH, Zool. Jahrb. Supp. iv, p. 534, fig.: n. sp.
Hermæa cremoniana, anatomy ; TRINCHESE (487).
Phidiana exigua, Chili ; BERGH, Zool. Jahrb. Supp. iv, p. 559, fig.: n. sp.
Platydorís punctatella, Chili ; BERGH, t. c. p. 521, fig.: n. sp.
Tethys fimbriata, development of ; VIGUIER, Arch. Zool. exp. vi, p. 37.
Tyrinna, n. g., p. 523, type *T. nobilis*, n. sp., p. 524, Chili ; BERGH, Zool. Jahrb. Supp. iv, fig.

TECTIBRANCHIATA.

- Aplysiidæ*, monograph commenced by CLESSIN in MARTINI & CHEMNITZ (267).
Aplysiopsis, n. g., type *A. juanina*, n. sp., Juan Fernandez ; BERGH, Zool. Jahrb. Supp. iv, p. 483, fig.
Ctione limacina, note on ; MCINTOSH, Ann. Nat. Hist. ii, p. 103.
Gastropteron meckelii, pedal glands ; RAWITZ, Int. J. Anat. xv, p. 199.
Pleurobranchidæ, monograph by VAYSSIÈRE, Ann. Sci. Nat. viii, pp. 209-402, 16 pls.
Pleurobranchus, list of species ; BERGH in SEMPER'S Reisen im Arch. Philippinen, Wiss. Result. vii, p. 118.
Pleurobranchus ypsilophora (von Ihering MS.), Naples ; VAYSSIÈRE, Ann. Sci. Nat. viii, p. 347, fig. : *P. platei*, Chili ; BERGH, Zool. Jahrb. Supp. iv, p. 494 : *P. cuvieri*, Mauritius, p. 129, *papuligerus*, Mozambique, p. 131,

strubelli, Amboina, p. 138, *diaphanus*, Philippines, p. 142; BERGH in SEMPER'S Reisen im Arch. Philippinen, Wiss. Result. vii, figg. : n. spp.

Tethys pilsbryi, Yucatan; LETSON, P. Ac. Philad. 1898, p. 193, fig.: n. sp.

Tornatina townsendi, Karachi; MELVILL, Mem. Manchester Soc. xlii, No. 4, p. 8, fig.: n. sp.

PROSOBRANCHIATA.

PECTINIBRANCHIATA.

TOXOGLOSSA.

TEREBRIDÆ, CONIDÆ, and PLEUROTOMIDÆ.

Bela woodiana, *decussata*, *pingelii*, new varieties; POSSELT, Medd. Grønland, xxiii, pp. 145, 154, 162, figg.

Clathurella foraminata, Reeve, n. var.; MELVILL (280), p. 13.

Conus flindersi, Victoria, p. 781, *barbara*, *frostiana*, Solomon Islands, p. 782; BRAZIER, P. Linn. Soc. N. S. Wales, xxii: *C. remo*, Victoria; BRAZIER, l. c. xxiii, p. 271: *C. (Leptoconus) dictator*, p. 9, *secularis*, p. 10, Persian Gulf; MELVILL, Mem. Manchester Soc. xlii, No. 4, figg. : n. spp.

Cythara hypercalles, Muscat; MELVILL, Mem. Manchester Soc. xlii, No. 4, p. 12, fig.: n. sp.

Mangilia (Glyphostoma) fenestrata, Aden; MELVILL, Ann. Nat. Hist. i, p. 198, fig.: n. sp.

Otitoma, n. gen. for *O. otitoma*, n. sp., Red Sea; JOUSSEAUME, Naturaliste, 1898, p. 106.

Pleurotoma (Drillia) angriasensis, Angrias Bank, p. 11, *resplendens*, Persian Gulf, p. 12; MELVILL, Mem. Manchester Soc. xlii, No. 4, figg. : n. spp.

Surcula digueti, California; MABILLE, Bull. Soc. Philom. ix, p. 78: *S. bouvieri*, Hab.—?; JOUSSEAUME, Naturaliste, 1898, p. 106: n. spp.

Terebra edgarii, Karachi; MELVILL, Mem. Manchester Soc. xlii, No. 4, p. 8, fig.: *T. andamanica*, p. 41, *celidonota*, p. 42, Andaman Islands; MELVILL & SYKES, P. Malac. Soc. London, iii, figg.: *T. texana*, Texas; DALL, Nautilus, xii, p. 45: n. spp.

RACHIGLOSSA.

OLIVIDÆ, MARGINELLIDÆ, VOLUTIDÆ, and MITRIDÆ.

Ancilla tindalli, Angrias Bank; MELVILL, Mem. Manchester Soc. xlii, No. 4, p. 14, fig.: n. sp.

Canilla [Cancilla] sura, Andaman Islands?; JOUSSEAUME, Naturaliste, 1898, p. 106: n. sp.

Halia, Risso, belongs to *Volutacea*; DALL, P. Ac. Philad. 1898, p. 190.

Marginella (Glabella) quilonica, Malabar Coast, p. 15 (*Persicula*) *oodes*, Persian Gulf, p. 16; MELVILL, Mem. Manchester Soc. xlii, No. 4, figg. : n. spp.

Mitra albopicta, New Zealand; SMITH, P. Malac. Soc. London, iii, p. 21, fig.: *M. jousseaumiana*, loc. not stated; MABILLE, Bull. Soc. Philom. ix, p. 78: n. spp.

Olivella blanesi, Cuba; FORD, Nautilus, xii, p. 66: n. sp.

Thala malvacea, Red Sea ; JOUSSEAUME, Naturaliste, 1898, p. 107 : n. sp.
Voluta kenyoniana, rossiteri, Victoria ; BRAZIER, J. Linn. Soc. N. S. Wales, xxii, p. 779 : n. spp.

FASCIOLARIIDÆ, TURBINELLIDÆ, BUCCINIDÆ, NASSIDÆ, COLUMBELLIDÆ, MURICIDÆ, and CORALLIOPHILIDÆ.

- Bucinum undatum*, p. 195, *grœnlandicum*, p. 202, *perdix*, pp. 204–207, *hydrophanum*, pp. 208 & 209, new varieties ; POSSELT, Medd. Grønland, xxiii.
Bullia ceroplasta, Mekran Coast, p. 17, (*Pseudostrombus*) *indusica*, Karachi, p. 18 ; MELVILL, Mem. Manchester Soc. xlii, No. 4, figg. : n. spp.
Chascax maderensis, Watson = *Latirus armatus*, Ad. ; MELVILL, J. Conch. ix, p. 115.
Columbella avara, note on ; PILSBRY, Nautilus, xii, p. 45.
Columbella (*Mitrella*) *brunnea*, Victoria ; BRAZIER, P. Linn. Soc. N. S. Wales, xxiii, p. 271 : n. sp.
Coralliophila wilsoni, Victoria ; PRITCHARD & GATLIFF, P. Soc. Victoria, x, p. 140 : *C. arabica*, Aden ; MELVILL, Ann. Nat. Hist. i, p. 199, fig. : n. spp.
Cumella [nom. præocc. in Crustacea], n. gen. for *C. cumella*, n. sp., Hab.—? ; JOUSSEAUME, Naturaliste, 1898, p. 201, fig.
Fusus arabicus, Arabia ; MELVILL, Mem. Manchester Soc. xlii, No. 4, p. 16, fig. : *F. (Roperia, n. sect.) roperi*, California ; DALL, Nautilus, xii, p. 4 : n. spp.
Lachesis bicolor, Persian Gulf ; MELVILL, Mem. Manchester Soc. xlii, No. 4, p. 14, fig. : *L. euthrioides*, Falkland Islands ; MELVILL & STANDEN, J. Conch. ix, p. 98, fig. : n. spp.
Latiaxis couturieri, New Britain ; JOUSSEAUME, Naturaliste, 1898, p. 22, fig. : n. sp.
Latirus armatus, Ad., note on ; MELVILL, J. Conch. ix, p. 115.
Murex (Ocinebra) flexirostris, Muscat ; MELVILL, Mem. Manchester Soc. xlii, No. 4, p. 19, fig. : n. sp.
Nassa (Hebra) polychroma, Aden ; MELVILL, Ann. Nat. Hist. i, p. 198, fig. : n. sp.
Northia angulosa, Hab.—? ; JOUSSEAUME, Naturaliste, 1898, p. 251, fig. : n. sp.
Roperia, n. sect. of *Fusus*, type *F. roperi*, n. sp. ; DALL, Nautilus, xii, p. 5.
Sipho (Siphonorbis) lindahli, p. 180, (*Tritonofusus*) *costiferus*, p. 183, Greenland ; POSSELT, Medd. Grønland, xxiii, figg. : n. spp.
†*Solutofusus*, n. gen. for *S. carinatus*, n. sp., Eocene of Victoria ; PRITCHARD, P. Soc. Victoria, xi, p. 101, fig.

TÆNIOGLOSSA.

CYPRÆIDÆ and STROMBIDÆ.

- Cypræa angustata*, new varieties of ; BEDDOME (33) : *C. caput-anguis* and *caput-serpentis*, notes on ; KENYON (219) : *C. rashleighana*, note on ; MELVILL, J. Conch. ix, p. 85.
Cypræidæ, Mediterranean species ; MONTEROSATO, J. Conchyl. xlv, p. 153.
†*Rhynchocypræa*, n. subgen. of *Cypræa*, type *C. leptorhyncha*, M'Coy ; COSSMANN, Rev. Paleozool. ii, p. 17.
Strombus belutschiensis, Mekran Coast ; MELVILL, Mem. Manchester Soc. xlii, No. 4, p. 37, fig. : n. sp.
Tiphobiidæ are nearly related to *Strombidæ* ; MOORE (302).

CERITHIIDÆ, PLANAXIDÆ, and TURRITELLIDÆ.

- Cerithiopsis* (*Seila*) *hinduorum*, Karachi; MELVILL, Mem. Manchester Soc. xlii, No. 4, p. 20, fig. : n. sp.
- Cerithium*, monograph concluded by KOBELT in MARTINI & CHEMNITZ (267).
- Cerithium janthinulum*, p. 223, n. n. for *C. janthinum*, Reeve, *C. egenulum*, p. 225, n. n. for *C. egenum*, Reeve, *C. mazatlanicum*, p. 237, n. n. for *C. quadrifilatum*, Reeve, *præoc.*; KOBELT in MARTINI & CHEMNITZ (267).
- Cerithium carnaticum*, Madras; MELVILL & STANDEN, J. Conch. ix, p. 31, fig. : n. sp.
- Colina selecta*, Madras; MELVILL & STANDEN, *t. c.* p. 31, fig. : n. sp.
- Euthymia colzumensis*, Red Sea; JOUSSEAUME, Bull. Soc. Philom. ix, p. 77 : n. sp.
- Inella perimensis*, *numerosa*, *ile*, Red Sea; JOUSSEAUME, *t. c.* p. 72 : n. spp.
- Mastonia mænades*, p. 72, *plecta*, *algens*, *tulipa*, p. 73, *interpictus*, *issa*, *alveatus*, *peanites*, p. 74, *iniqua*, p. 75, Red Sea; JOUSSEAUME, *t. c.* : n. spp.
- Obesula*, n. gen. of *Triphoridae* for *O. borbonica*, n. sp., Red Sea; JOUSSEAUME, *t. c.* p. 75.
- Obesula senilis*, p. 75, *pantherina*, (?) *mus*, p. 76, Red Sea; JOUSSEAUME, *t. c.* : n. spp.
- †*Rhabdospira*, n. subgen. of *Aclisina* for *R. selkirkii* and *R. compacta*, n. spp.; DONALD, Quart. Journ. Geol. Soc. liv, p. 65.
- Tanganyicia*, referred to *Planaxidae*, with anatomical notes; MOORE, Quart. J. Micr. Sci. xli, p. 306; IDEM, P. R. Soc. London, lxii, p. 457, fig.
- Triforis* (*Iniforis*) *cornuta*, p. 249, *jousseaumei*, p. 250, *goubini*, *formosula*, p. 251, *pæcila*, p. 252, (*Inella*) *montrouzieri*, p. 253, *episcopalis*, *melantera*, p. 254, *rutilans*, p. 255, *aurea*, (*Mastonia*) *loyaltyensis*, p. 256, *monacha*, p. 257, *tæniolata*, *fulvescens*, p. 258, *papillata*, *mediotincta*, p. 259, *ustulata*, p. 260, *leucomys*, *lucidula*, p. 261, *lamberti*, p. 262, *trogodytes*, *turricula*, p. 263, *quadrimaculata*, *amæna*, p. 264, (*Viriola*) *intergranosa*, p. 266, New Caledonia; HERVIER, J. Conchyl. xlv : n. spp.
- Viriola morychus*, Red Sea; JOUSSEAUME, Bull. Soc. Philom. ix, p. 76 : n. sp.

PSEUDOMELANIIDÆ, MELANIIDÆ, and LITTORINIDÆ.

- Bathanalia howesii*, n. gen. and sp. of *Tiphobiidae*, Tanganyika; MOORE, P. R. Soc. London, lxii, p. 451, fig. [also in P. Malac. Soc. iii, p. 92, fig., and Quart. J. Micr. Sci. xli, p. 192 (with anatomy)].
- Bythoceras iridescentis*, n. gen. and sp. of *Purpurinidae* (= *Paramelaniidae*), Lake Tanganyika; MOORE, P. R. Soc. London, lxii, p. 451, fig. [also in P. Malac. Soc. iii, p. 93, fig.].
- Hirthia*, n. g. for *H. littorina*, p. 142, *globosa*, p. 144, n. spp., Lake Tanganyika; ANCEY, Bull. Mus. Marseille, i, figg.
- Lavigeria* (?) *lechaptosi*, Lake Tanganyika; ANCEY, Bull. Mus. Marseille, i, p. 145, fig. : n. sp.
- Littorina*, shell-variation in; DUNCKER (131).
- Melania martini*, n. n. for *M. junghuhnii*, Schepman non Martin; SCHEPMAN, Notes Leyden Mus. xx, p. 84.
- Melania* (*Melanioides*) *badia*, Enganio I.; HENDERSON, Nautilus, xii, p. 14, fig. : *M. (Amphimelania) hispanica*, Spain, p. 178, (*A.*) *induta*, Muchalatka, p. 179; WESTERLUND, Ann. Mus. St. Petersb. 1898 : *M. monacha*,

p. 21, *carota*, p. 28, *tomoriensis*, p. 33, *kuli*, p. 35, *centaurus*, p. 36, Celebes; SARASIN (402), figg. : n. spp.

Melaniidæ divided into three main groups, founded on differences in the radula and operculum; SARASIN (402).

Melanopsis chobauti, Biskra; NICOLAS, C.R. Ass. France, 1897, p. 530: *M. pseudoferussaci*, Morocco; PALLARY, J. Conchyl. xlv, p. 139, fig. : n. spp.

Paramelania is a synonym of *Purpurina*; MOORE, Quart. J. Micr. Sci. xli, p. 307.

†*Streblorhamphus*, Tate and Cossmann, n. gen. of *Lacunidæ*, type *S. mirulus*, n. sp., Eocene; TATE, J. R. Soc. N. S. Wales, xxxi, p. 401.

Typhobia horei, anatomy of; MOORE (302).

RISSOIIDÆ, HYDROBIIDÆ, VIVIPARIDÆ, VALVATIDÆ, and AMPULLARIIDÆ.

Amnicola parva and *A. orbiculata*, notes on; PILSBRY, Nautilus, xii, p. 43. *Amnicola missouriensis*, Missouri, *walkeri*, Michigan; PILSBRY, Nautilus, xii, p. 43: *A. confinis*, Blažuj; BRANCSIK, Jahresh. Ver. Trencsen, xix, p. 90 : n. spp.

Ampullaria urceus, a reno-pericardiac pore in; BURNE (77).

Ampullaria pinei, Florida; DALL, Nautilus, xii, p. 75: *A. leopoldvillensis*, Congo Free State; PUTZEYS, Pr.-verb. malac. Belgique, xxvii, p. xcvi, fig. : n. spp.

Barleeia neozelanica, New Zealand; SUTER, P. Malac. Soc. London, iii, p. 8, fig. : n. sp.

Belgrandia serignanensis, *obscurata*, p. 532, *monterosatoi*, p. 533, *collieri*, *margieri*, p. 534, *confusa*, p. 536, France; NICOLAS, C.R. Ass. France, 1897, figg. : n. sp.

Bythinella barbantensis, France; NICOLAS, C.R. Ass. France, 1897, p. 531, fig. : n. sp.

Bythinia cazioti, Corsica; LOCARD, Échange, An. xiv, p. 67 : n. sp.

†*Chileutomia*, Tate & Cossmann, n. gen. of *Rissoiidæ*, type *C. subvaricosus*, n. sp., Eocene; TATE, J. R. Soc. N. S. Wales, xxxi, p. 403.

Glaucotraccia, n. subgen. of *Vivipara*, for *V. paulucciana*, Tap.-Can.; ANCEY, P. Linn. Soc. N. S. Wales, xxii, p. 777.

Lanistes bourguignoni, Congo Free State; PUTZEYS, Pr.-verb. malac. Belgique, xxvii, p. xxvi, fig. : n. sp.

Lygogyrus granum, note on; PILSBRY, Nautilus, xii, p. 42.

Paludestrina bucheti, Morocco; MABILLE, Bull. Soc. Philom. ix, p. 81: *P. hamiltoni*, Macquarie Island; SMITH, P. Malac. Soc. London, iii, p. 22, fig. : n. spp.

Paludina leopoldvillensis, Congo Free State; PUTZEYS, Pr.-verb. malac. Belgique, xxvii, p. xxv, fig. : *P. duchieri*, Tonkin; FISCHER, Bull. Sci. France Belgique, xxviii, p. 330, fig. : *P. simonis*, p. 17, *lagrandieri*, p. 18, River Mekong; BAVAY, J. Conchyl. xlv, figg. : n. spp.

Pseudampullaria, n. n. for *Brazieria*, Petterd non Ancey; ANCEY, Bull. Mus. Marseille, i, p. 148.

Rissoia huttoni, nom. nov. for *R. nana*, Hutton non Phil.; SUTER, P. Malac. Soc. London, iii, p. 2.

Rissoia hamiltoni, p. 2, *fumata*, *lubrica*, *foveauxiana*, p. 5, New Zealand; SUTER, P. Malac. Soc. London, iii, figg. : n. spp.

Rissoina (*Morchella*) *thaumasia*, Madras; MELVILL & STANDEN, J. Conch. ix, p. 31, fig. : *R. angusta*, New Caledonia; HEDLEY, P. Linn. Soc. N. S. Wales, xxiii, p. 104, fig. : n. spp.

Tasmaniella, n. n. for *Beddomea*, Petterd non Nevill; ANCEY, Bull. Mus. Marseille, i, p. 148.

Valvata lilljeborgi, Sweden, p. 137, *fennica*, Finland, p. 197; WESTERLUND, Acta Soc. Faun. Fenn. xiii: *V. (Cincinna) hellenica*, Greece; WESTERLUND, Ann. Mus. St. Petersb. 1898, p. 179 : n. spp.

CYCLOPHORIDÆ and CYCLOSTOMATIDÆ.

- †*Allardia*, n. gen. for *A. admirabilis*, n. sp., Tertiary of Baux; NICOLAS, C.R. Ass. France, 1897, p. 380.
- Austrocyclus*, apparently n. gen. for *Cyclophorus wahlbergi*; ANCEY, Bull. Mus. Marseille, i, p. 136 [= *Hijabia*, q. v.].
- Cataulus*, list of species from Ceylon, with *C. nevilli*, p. 68, *C. colletti*, p. 69, n. spp., figg.; SYKES, P. Malac. Soc. London, iii, pp. 66-69.
- Chondrocyclus*, n. gen. for *Cyclophorus convexiusculus*, Pfr.; ANCEY, Bull. Mus. Marseille, i, p. 136 [in a footnote].
- Crossopoma enganoense*, Enganio I.; HENDERSON, Nautilus, xii, p. 17, fig. : n. sp.
- Cyathopoma leptomita*, Ceylon; SYKES, P. Malac. Soc. London, iii, p. 69, fig. : *C. conoideum*, *colletti*, Ceylon; SYKES, t. c. p. 159, figg. : n. spp.
- Cyclophorus vesconesi* is an error for *C. vasconesi*; JOUSSEAUME, Naturaliste, 1898, p. 81.
- Cyclophorus rosenbergi*, Ecuador; DA COSTA, P. Malac. Soc. London, iii, p. 82, fig. : *C. minimus*, S. Africa; MELVILL & PONSONBY, Ann. Nat. Hist. ii, p. 129, fig. : *C. (Litostylus) orthostylus*, Annam; MOELLEN-DORFF, Nachrbl. Deutsch. malak. Ges. 1898, p. 80: *C. (Scabrinus) brounæ*, Ceylon; SYKES, P. Malac. Soc. London, iii, p. 73, figg. : n. spp.
- Cyclostoma mauretanicum*, Morocco; PALLARY, J. Conchyl. xlv, p. 131 : n. sp.
- Cyclotus (Procyclus) porrectus*, Annam; MOELLEN-DORFF, Nachrbl. Deutsch. malak. Ges. 1898, p. 84: *C. (Pseudocyclophorus) lombockensis*; SMITH, P. Malac. Soc. London, iii, p. 31, fig. : n. spp.
- Diplommata obesa*, New Caledonia; HEDLEY, P. Linn. Soc. N. S. Wales, p. 102, fig. : *D. lombockensis*, Lombock; SMITH, P. Malac. Soc. London, iii, p. 31, fig. : *D. whiteheadi*, North Borneo; SMITH, t. c. p. 34, fig. : n. sp.
- D. (Nicida) catathymia*, Ceylon; SYKES, t. c. p. 69, fig. : n. sp.
- D. liwaensis*, Sumatra; ALDRICH, Nautilus, xii, p. 4, fig. : n. spp.
- Diploptychia*, n. sect. of *Diplommata*, first species *D. heliscus*, Mlldf.; MOELLEN-DORFF, Abh. Ges. Görlitz, xxii, p. 201.
- Ditropis septentrionalis*, Philippines; MOELLEN-DORFF, Nachrbl. Deutsch. malak. Ges. 1898, p. 11 : n. sp.
- Eupomatias*, n. sect. of *Pomatias*, first species *P. henricæ*, Strobel; WAGNER, Denk. Ak. Wien, lxiv, p. 571.
- Hijabia*, nom. nov. for *Natalia*, Godwin-Austen non Gray; GODWIN-AUSTEN (155), p. 46.
- Lagocheilus marangensis*, Sumatra; ALDRICH, Nautilus, xii, p. 3, fig. : n. sp.
- Leptopoma fultoni*, Sumatra; ALDRICH, t. c. p. 3, fig. : n. sp.
- Omphalotropis (Selenomphala) dohertyi*, Sumatra; ALDRICH, t. c. p. 3, fig. : n. sp.
- Plectocyclotus*, n. subgen. of *Neocyclotus*, first species *N. asperulus*, Sby.; KOBELT & MOELLEN-DORFF, Nachrbl. Deutsch. malak. Ges. 1897, p. 138 [included in a revised reprint (July, 1898) of these pages, not in the original].
- Pleuropoma*, n. sect. of *Pomatias*, first species *P. tessellatus*, Rossm.; WAGNER, Denk. Ak. Wien, lxiv, p. 621.

- Pomatias*, review of genus, which is divided into five n. sect. and several groups under the name of 'formenkreis'; WAGNER, *t. c.* pp. 565-632.
- Pomatias* (*Eupomatias*) *braueri*, p. 574, *waldermari*, p. 616, Croatia; WAGNER, *t. c.* figg. : n. spp. [already described; cf. Zool. Rec. xxxiv, p. 65].
- Pterocyclus bathyschisma*, Annam; MOELLENDORFF, Nachrbl. Deutsch. malak. Ges. 1898, p. 82: *P. marioni*, Laos and Tonkin; ANCEY, Bull. Mus. Marseille, i, p. 137, fig. : n. spp.
- Pupina sucinacia*, Bttg., is a synonym of *P. junghuhnii*, Mts.; SCHEPMAN, Notes Leyden Mus. xx, p. 84: *P. enoptrum*, Moell., is the same as *P. nasuta*, Smith; ANCEY, P. Linn. Soc. N. S. Wales, xxii, p. 772.
- Pupina laffonti*, Pulo Condor; ANCEY, Bull. Mus. Marseille, i, p. 139: *P. billeti*, Tonkin; FISCHER, Bull. Sci. France Belgique, xxviii, p. 333, fig. : n. spp.
- Pupinella luteola*, Brancsik, is a synonym of *P. fultoni*, Smith; ANCEY, P. Linn. Soc. N. S. Wales, xxv, p. 771.
- Pupinella loheri*, Philippines; MOELLENDORFF, Nachrbl. Deutsch. malak. Ges. 1898, p. 11 : n. sp.
- Raphaulus*, list of known species, with *R. perakensis*, n. sp., Perak; SMITH, P. Malac. Soc. London, iii, p. 17.
- Registoma obliquum*, Lombock; SMITH, P. Malac. Soc. London, iii, p. 31, fig. : n. sp.
- Rhabdotakra*, n. sect. of *Pomatias*, first species *P. insubricus*, Pini; WAGNER, Denk. Ak. Wien, lxiv, p. 583.
- Stereopoma*, n. sect. of *Pomatias*, first species *P. turriculatus*, Phil.; WAGNER, *t. c.* p. 592.
- Sychnotropis*, n. sect. of *Omphalotropis*, first species *O. semperi*, Mldff.; MOELLENDORFF, Abh. Ges. Görlitz, xxii, p. 202.
- Titanopoma*, n. sect. of *Pomatias* for *P. auritus*, Rossm.; WAGNER, Denk. Ak. Wien, lxiv, p. 626.

TRUNCATELLIDÆ.

- Coxiella*, note on genus, with *C. confusa*, nom. nov. for *C. striatula*, Auct. non Menke; SMITH, P. Malac. Soc. London, iii, pp. 75-76.

CAPULIDÆ, XENOPHORIDÆ, LAMELLARIIDÆ, NATICIDÆ, and ADEORBIDÆ.

- Adeorbis* is akin to *Rissoiidae* and *Naticidae*, but forms a distinct family; WOODWARD, P. Malac. Soc. London, iii, p. 146.
- Adeorbis umbilicatus*, Jeffreys MS., Gulf of Gascony; LOCARD (243), p. 11, fig. : n. sp.
- Calyptræa* (*Galerus*) *edgariana*, Aden; MELVILL, Ann. Nat. Hist. i, p. 201, fig. : n. sp.
- Capulus simplex*, P. Fischer MS., N. W. Africa; LOCARD (243), p. 64, fig. : n. sp.
- Chytra*, n. gen. for *Limnotrochus kirki*, Smith, which belongs to *Xenophoridae*; MOORE, Quart. J. Micr. Sci. xli, p. 307 [not described].
- Crepidula fornicata*, shell adapted to that of *Pecten*; GRAF, Tr. New York Ac. xv, p. 67.
- Crepidula gryphæa*, Cape Verdes; LOCARD (243), p. 64, fig. : n. sp.
- Marseniidae*, observations on; BERGH, Zool. Jahrb. Supp. iv, pp. 562-573, figg.
- Spekia* belongs to the *Naticidae*; MOORE, Quart. J. Micr. Sci. xli, p. 306.

PTENOGLOSSA.

SCALARIIDÆ.

- Aclis exæreta*, Aden ; MELVILL, Ann. Nat. Hist. i, p. 199, fig. : n. sp.
Scalaria malcolmensis, Persian Gulf ; MELVILL, Mem. Manchester Soc. xlii, No. 4, p. 20, fig. : n. sp.

GYMNOGLOSSA.

EULIMIDÆ and PYRAMIDELLIDÆ.

- Eulima shoplandi*, Aden ; MELVILL, Ann. Nat. Hist. i, p. 200, fig. :
E. orthopleura, S. Australia, p. 80, *commensalis*, S. Australia and N. S. Wales, *indiscreta*, S. Australia, Tasmania, and N. S. Wales, p. 82 ; TATE, Tr. R. Soc. S. Austral. xxii, figg. : n. spp.
Eulimella kaisensis, Persian Gulf ; MELVILL, Mem. Manchester Soc. xlii, No. 4, p. 21, fig. : *E. tricineta*, S. Australia ; TATE, Tr. R. Soc. S. Austral. xxii, p. 83, fig. : n. spp.
Leiostraca constellata, Aden ; MELVILL, Ann. Nat. Hist. i, p. 200, fig. : n. sp.
Leucotina gratiosa, Persian Gulf ; MELVILL, Mem. Manchester Soc. xlii, No. 4, p. 7, fig. : n. sp.
Miralda opephora, Karachi ; MELVILL, Mem. Manchester Soc. xlii, No. 4, p. 21, fig. : n. sp.
Odontostomia (*Syrnola*) *infrasulcata*, S. Australia, p. 83, (*Pyrgulina*) *mayii*, Tasmania, p. 84 ; TATE, Tr. R. Soc. S. Austral. xxii, figg. : n. spp.
Syrnola maderaspatana, Madras ; MELVILL & STANDEN, J. Conch. ix, p. 32, fig. : n. sp.
Turbonilla coromandelica, Madras ; MELVILL & STANDEN, *t. c.* p. 32, fig. : *T. varicifera*, S. Australia ; TATE, Tr. R. Soc. S. Austral. xxii, p. 85, fig. : *T. basilica*, Persian Gulf, p. 22 (*Pyrgostelis*) *manora*, (*P.*) *templaris*, Karachi, p. 23 ; MELVILL, Mem. Manchester Soc. xlii, No. 4, figg. : n. spp.

SCUTIBRANCHIATA.

PROSERPINIDÆ.

- Ceres nelsoni*, Mexico ; DALL, Nautilus, xii, p. 27 : n. sp.

NERITIDÆ, TURBINIDÆ, TROCHIDÆ, DELPHINULIDÆ, and CYCLOSTREMATIDÆ.

- Calliostoma conuloides*, n. var. from Canaries ; MABILLE, Bull. Soc. Philom. ix, p. 92.
Calliostoma duricastellum, Ceylon ; MELVILL, Mem. Manchester Soc. xlii, No. 4, p. 26, fig. : n. sp.
Cyclostrema dautzenbergianum, p. 40, *monterosatoi*, p. 41, Algiers ; ANCEY, Nautilus, xii [former also in Bull. Mus. Marseille, i, p. 149, fig.] : n. spp.
Eulithidium, n. n. for *Eucosmia*, Cptr., nom. preocc. ; PILSBRY, Nautilus, xii, p. 60.
Gibbula michaudi, note on ; LOCARD (248) : *G. cineraria*, note on ; IDEM (249).

- Gibbula obesula*, P. Fischer MS., Morocco, p. 47, *sculpturata*, Portugal and Morocco, p. 49, *inoptanda*, P. Fischer MS., p. 51, *hannonis*, P. Fischer MS., p. 52, N. W. Africa, *hettematica*, Portugal, p. 54, *corallioides*, Monts. MS., Cape Verdes, p. 58; LOCARD (243), figg. : n. spp.
- Halistylus*, note on genus; PILSBRY, Nautilus, xii, p. 46.
- Leptothyra yemenensis*, Aden; MELVILL, Ann. Nat. Hist. i, p. 201, fig. : n. sp.
- Lunella viridicallus*, Red Sea; JOUSSEAUME, Naturaliste, 1898, p. 251 : n. sp.
- Margarita sharpii*, Alaska; PILSBRY, P. Ac. Philad. 1898, p. 486, fig. : n. sp.
- Monodonta (Austrocochlea) quadrasi*, Philippine Islands; SOWERBY, P. Malac. Soc. London, iii, p. 9, fig. : n. sp.
- Morchia mariae*, Ceylon; JOUSSEAUME, Naturaliste, 1898, p. 201 : n. sp.
- Nerita (Heminerita) anodonta*, Karachi; MELVILL, Mem. Manchester Soc. xlii, No. 4, p. 24, fig. : n. sp.
- Neritina tingitana*, Morocco; PALLARY, J. Conchyl. xlv, p. 148, fig. : n. sp.
- Pseudoliotia*, n. gen., type *Cyclostrema micans*, A. Ad.; TATE, Tr. R. Soc. S. Austral. xxii, p. 71.
- Solariella mogadorensis*, p. 24, *talismani*, p. 25, Morocco, *effossima*, Cape Verdes, p. 27, *cingulima*, Portugal, p. 29, *rudecta*, Morocco, p. 33; LOCARD (243), figg. : n. spp.
- +*Sphærochilus*, n. n. for *Oncochilus*, Pethö, non *Oncochila*, Stal.; COSSMANN, Rev. Paleozool. ii, p. 150.
- Teinostoma oppletum*, New Caledonia; HEDLEY, P. Linn. Soc. N. S. Wales, xxiii, p. 101, fig. : n. sp.
- Trochus (Infundibulum) fultoni*, Karachi; MELVILL, Mem. Manchester Soc. xlii, No. 4, p. 25, fig. : n. sp.
- Turricula miranda*, P. Fischer MS., Azores; LOCARD (243), p. 21, fig. : n. sp.
- Zizyphinus milne-edwardsi*, N. W. Africa, p. 35, *triporcatus*, P. Fischer MS., N. Africa, p. 36, *laqueatus*, p. 38, *oppansus*, p. 40, N. W. Africa, *cleopatra*, P. Fischer MS., N. Africa, p. 44; LOCARD (243), figg. : n. spp.

HALIOTIDÆ, PLEUROTOMARIIDÆ, BELLEROPHONTIDÆ, and FISSURELLIDÆ.

- +*Aclisoides*, n. section of *Murchisonia*; DONALD, Quart. J. Geol. Soc. liv, p. 66.
- Emarginula elata*, N. W. Africa, p. 82, *intervecta*, Corsica, p. 86; LOCARD (243), figg. : n. spp.
- Fissurella saharica*, P. Fischer MS., N. W. Africa; LOCARD (243), p. 72, fig. : n. sp.
- +*Gyrodoma*, n. gen. of *Murchisonia*, type *Eunema etheridgei*, Cresswell, Lower Palæozoic; ETHERIDGE, Rec. Austral. Mus. iii, p. 72.
- Haliotis cracherodii*, note on; PILSBRY, Nautilus, xii, p. 79: Artificial production of pearls in *Haliotis*; BOUTAN (55).
- +*Isostoma*, ?n. gen. for *I. bucanioides*, Koken; KOKEN, Bull. Ac. St. Petersb. vii, p. 137.
- +*Micrentoma*, n. g. for *Aclisina nana*, De Koninck; DONALD, Quart. J. Geol. Soc. liv, p. 69.
- Pleurotomaria*, notes on; LACAZE-DUTHIERS, Arch. Zool. exp. vi, pp. 181-187: Anatomy and list of recent species and specimens; BOUVIER & FISCHER, t. c. pp. 115-180, figg. : Note on anatomy; BOUVIER & FISCHER (57).
- Puncturella fornicata*, N. W. Africa; LOCARD (243), p. 78, fig. : n. sp.

ACMÆIDÆ, PATELLIDÆ, and LEPETIDÆ.

- Acmaea fragilis*, anatomy of ; WILLCOX, Jena. Zeitschr. xxxii, p. 411 :
A. virginea, development of ; BOUTAN (54).
 †*Hypseloconus*, n. g. [of *Patellidæ*?], type *H. recurvus* (Whitf.) var. *elongatus*, n. var., from the Dresbach (= Upper Cambrian), Minnesota ;
 BERKEY, Amer. Geol. xxi, p. 282, figg.
Lepeta costulata, nom. nov. for *L. tubicola*, Jeff. non Verrill & Smith ;
 LOCARD (243), p. 96.
Patella vulgata, reno-pericardiac canals in ; GOODRICH (157).
Patella nidulina, Azores, p. 88, *mabillei*, Morocco, p. 92 ; LOCARD (243),
 figg. : n. spp.
Patellidæ, notes on ; TRAVERS (486).

III. SCAPHOPODA.

- Monograph completed with bibliographical list of recent and fossil species ;
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 P. and S., Cape Florida, p. 151, *dalli*, P. and S., W. Patagonia, p. 155,
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 PILSBRY in TRYON (488), xvii, p. 249.

IV. PELECYPODA.

- On the development of the embryonic shell ; BERNARD (44) : Review by
 FISCHER (142).
 Some species described by SMITH from the 'Investigator' collections
 figured by ALCOCK & ANDERSON, Ill. Zool. Investigator, Pls. vii
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SEPTIBRANCHIATA.

- Cetoconcha atypha*, Atlantic coast of N. America ; VERRILL & BUSH,
 P. U. S. Mus. xx, p. 814, fig. : n. sp.
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- coast of N. America ; VERRILL & BUSH, P. U. S. Mus. xx, figg. : *C. semirostrata*, Morocco and Azores, p. 177, *nitens*, Cape Finistère, Morocco, and Canaries, p. 181, *imbricata*, Jeffreys MS., Spain, p. 187, *striolata*, Spain and Portugal, p. 195 ; LOCARD (243), figg. : n. spp.
- Halonympha striatella*, Atlantic coast of N. America ; VERRILL & BUSH, P. U. S. Mus. xx, p. 810, fig. : n. sp.
- Myonera* (?) *pretiosa*, Atlantic coast of N. America ; VERRILL & BUSH, *t. c.* p. 812, fig. : n. sp.

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- Clidiophora inornata*, Atlantic coast of N. America ; VERRILL & BUSH, P. U. S. Mus. xx, p. 819, fig. : n. sp.
- Kennerlia brevis*, Atlantic coast of N. America ; VERRILL & BUSH, *t. c.* p. 821, fig. : n. sp.
- Lyonsia granulifera*, Atlantic coast of N. America ; VERRILL & BUSH, *t. c.* p. 818, fig. : n. sp.
- Lyonsiella cordata*, Atlantic coast of N. America ; VERRILL & BUSH, *t. c.* p. 818, fig. : n. sp.
- Mytilimeria compressa*, Canaries, p. 211, *fischeri*, Jeffreys MS., Spain, p. 212, *saharica*, N. W. Africa, p. 213 ; LOCARD (243), figg. : n. spp.
- Periploma indicum*, Arabian Sea ; MELVILL, Mem. Manchester Soc. xlii, No. 4, p. 36, fig. : *P. affinis*, Atlantic coast of N. America ; VERRILL & BUSH, P. U. S. Mus. xx, p. 822, fig. : n. spp.
- †*Phenacomya*, n. gen., type *Pholadomya cuneata*, Sby. ; DALL, Tr. Wagner Inst. iii, p. 823.
- Pholadomya africana*, P. Fischer MS., Morocco ; LOCARD (243), p. 165, fig. : n. sp.
- Thracia adenensis*, Aden ; MELVILL, Ann. Nat. Hist. i, p. 206, fig. : *T. antarctica*, Falkland Islands ; MELVILL & STANDEN, J. Conch. ix, p. 105, fig. : n. spp.
- Verticordia transversa*, Azores, p. 201, *densicostata*, N. W. Africa, p. 202, *triangularis*, Azores, p. 207, *carinifera*, Morocco, p. 208 ; LOCARD (243), figg. : n. spp.

PHOLADACEA.

- Calobates*, note on genus and on *C. saulii*, Wright ; HEDLEY, P. Linn. Soc. N. S. Wales, xxiii, p. 94.
- Calobates fluviatilis*, Fiji ; HEDLEY, P. Linn. Soc. N. S. Wales, xxiii, p. 93, fig. : n. sp.
- Martesia* (*Martesiella*) *fragilis*, Atlantic coast of N. America ; VERRILL & BUSH, P. U. S. Mus. xx, p. 777, fig. : n. sp.
- Martesiella*, n. subgen. of *Martesia* for *M. fragilis*, n. sp., Atlantic coast of N. America ; VERRILL & BUSH, *t. c.* p. 777, fig.
- Scyphomya*, n. gen. of *Teredinidae*, type *Pholas semicostata*, Lea ; DALL, Tr. Wagner Inst. iii, p. 822.

MYACEA and CARDIACEA.

- Anticorbula*, n. sect. of *Corbula*, type *Himella fluviatilis*, H. Ad. ; DALL, Tr. Wagner Inst. iii, p. 839.
- †*Barrettia* belongs more probably to the Cœlenterata than the Mollusca ; WHITFIELD, Bull. Amer. Mus. ix, p. 233.

- Cardium vulva*, Japan; JOUSSEAUME, *Naturaliste*, 1898, p. 81 : n. sp.
Corbulidae, notes on family and its genera; DALL, *Tr. Wagner Inst.* iii, p. 836 *et seqq.*
† *Hemidiscors*, n. sect. of *Eucardium* for *H. rugiferum*, n. sp., Tongrian of Liguria; ROVERETO, *Atti Soc. Ligustica*, ix, p. 181.
Hippopus hippopus, very large specimen; SMITH, *P. Malac. Soc. London*, iii, p. 111.
† *Hypelasma*, n. g., for *H. colloti*, n. sp. from the Upper Tithonian of Gard; PAQUIER, *Bull. Soc. geol. France*, xxv, pp. 847–851, figg.
† *Monnieria*, n. subgen. of *Matheronia*, for *M. romani*, n. sp., from the Upper Tithonian of Gard; PAQUIER, *t. c.* pp. 843–847, figg.
Novaculina xyreces, Aden; MELVILL, *Ann. Nat. Hist.* i, p. 202, fig. : n. sp.
† *Pseudocorbula*, n. g. for *P. sandbergeri*, n. sp., Trias; PHILIPPI, *Jahresh. Ver. Wurttemb.* liv, p. 168.
† *Rousselia*, n. g. for *R. guilhoti*, n. sp. from the Upper Campanian of Lasserre (Ariège); DOUVILLÉ, *Bull. Soc. geol. France*, xxvi, p. 151, fig.
† *Rudistes*, studies on the; DOUVILLÉ (130).
Solecurtus, on the siphon in; FAUSSEK, *Trudui St. Peterb. Obsch.* xxviii, p. 270.
Solen, on the siphon in; FAUSSEK, *t. c.* p. 270.
Tridacna gigas, large specimens; SMITH, *P. Malac. Soc. London*, iii, p. 111.
† *Tugeniopsis*, n. subgen. (?) of *Tugonia*, type *T. compacta*, n. sp., Miocene of Carolina; DALL, *Tr. Wagner Inst.* iii, p. 860.

VENERACEA and TELLINACEA.

- Anapella*, n. n. for *Anapa*, Gray, 1853 *non* 1847; DALL, *P. Malac. Soc. London*, i, p. 213.
Atactodea, n. gen. of *Mesodesmatidae*, type *Paphia glabrata*, Lam.; DALL, *Tr. Wagner Inst.* iii, p. 911 [cf. *P. Malac. Soc.* i, p. 213].
Circe nana, Indian Ocean; MELVILL, *Mem. Manchester Soc.* xlii, No. 4, p. 31, fig. : n. sp.
Caelomactra, n. subgen. of *Mactra*, type *M. violacea*, Chemn.; DALL, *Tr. Wagner Inst.* iii, p. 875 [cf. *P. Malac. Soc.* i, p. 211].
Cyamimactra, n. gen. for *C. problematica*, n. sp., Stewart Island; BERNARD, *Bull. Mus. Paris*, iii, p. 311, fig.
Cyclomactra, n. subgen. of *Mactra*, type *M. tristis*, Gray; DALL, *Tr. Wagner Inst.* iii, p. 875 [cf. *P. Malac. Soc.* i, p. 211].
Cytherea (Tivela) crassatelloides, varieties of; CONRAD, *P. U. S. Mus.* xxi, p. 371.
Gari erasmia, Persian Gulf; MELVILL, *Mem. Manchester Soc.* xlii, No. 4, p. 33, fig. : *G. amianta*, Aden; MELVILL, *Ann. Nat. Hist.* i, p. 204, fig. : n. spp.
Leptospisula, n. subgen. of *Spisula*, type *Mactra striatella*, Lam.; DALL, *Tr. Wagner Inst.* iii, p. 879 [cf. *P. Malac. Soc.* i, p. 211].
Macoma suteri, New Zealand; SMITH, *P. Malac. Soc. London*, iii, p. 23, fig. : n. sp.
Mactracea, notes on the superfam. and its sections; DALL, *Tr. Wagner Inst.* iii, p. 862 *et seqq.*
Mactra ordinaria, New Zealand; SMITH, *P. Malac. Soc. London*, iii, p. 23, fig. : n. sp.
Mactroderma, n. subgen. of *Mactra*, type *M. velata*, Phil.; DALL, *Nautilus*, viii, 1894, p. 39.
Mesodesmatidae, notes on family and genera; DALL, *Tr. Wagner Inst.* iii, p. 907 *et seqq.*

- Perrierina*, n. gen. for *P. taxodonta*, n. sp., Stewart Island ; BERNARD, Bull. Mus. Paris, iii, p. 312, fig.
- Petricola lyra*, Aden ; MELVILL, Ann. Nat. Hist. i, p. 204, fig. : n. sp.
- Psammobiidae* of N. America ; DALL, P. Ac. Philad. 1898, pp. 57-62.
- Raetella*, n. subgen. of *Labiosa*, type *R. tenuis*, n. sp., Japan ; DALL, Tr. Wagner Inst. iii, p. 882 [cf. P. Malac. Soc. i, p. 212].
- Raetina*, n. subgen. of *Raeta*, type *R. indica*, n. sp., Bombay ; DALL, Tr. Wagner Inst. iii, p. 882 [cf. P. Malac. Soc. i, p. 212].
- Resania lanceolata*, anatomy ; DALL (107).
- Sanguinolaria hendersoni*, Madras ; MELVILL & STANDEN, J. Conch. ix, p. 33, fig. : n. sp.
- Semele shoplandi*, Aden ; MELVILL, Ann. Nat. Hist. i, p. 205, fig. : n. sp.
- Tellina* (*Arcopagia*) *habrotima*, Angrias Bank, (*Mera*) *actinota*, p. 34, (*Angulus*) *sericata*, Muscat, p. 35 ; MELVILL, Mem. Manchester Soc. xlii, No. 4, figg. : *T. (Tellinella) manumissa*, p. 202, (*Angulus*) *yemenensis*, p. 203, Aden ; MELVILL, Ann. Hist. i, figg. : *T. (Strigilla) rudolphi*, Victoria ; BRAZIER, P. Linn. Soc. N. S. Wales, xxiii, p. 272 : n. spp.
- Zenatia deshayesii*, anatomy ; DALL (107).

SUBMYTILACEA.

- Palæarctic *Naiades* ; BOETTGER (51).
- Anodonta imbecillis*, hermaphroditism of ; STERKI (457).
- Anodonta fedderseni*, Denmark, p. 179, *goësi*, p. 188, *anura*, p. 197, Sweden ; WESTERLUND, Acta Soc. Faun. Fenn. xiii : n. spp.
- Anodontoides*, n. n. for *Anodontopsis*, nom. preocc. ; SIMPSON in BAKER, Bull. Chicago Ac. iii, p. 72.
- Anodontopsis*, n. gen. of *Unionidae* ; SIMPSON in BAKER, Tr. Ac. St Louis, viii, p. 76 [nom. preocc. : renamed *Anodontoides*, q. v.].
- Axinodon*, n. gen. of *Diplodontidae* for *A. ellipticus*, n. sp., Atlantic coast of N. America ; VERRILL & BUSH, P. U. S. Mus. xx, p. 795, fig.
- Axinopsis cordata*, Atlantic coast of N. America ; VERRILL & BUSH, t. c. p. 795, fig. : n. sp.
- Axinulus*, n. subgen. of *Cryptodon* for *C. brevis*, n. sp., Atlantic Coast of N. America ; VERRILL & BUSH, t. c. p. 790.
- Burtonia carrei*, Congo Free State ; PUTZEYS, Pr.-verb. malac. Belgique, xxvii, p. xxviii, fig. : n. sp.
- Callocardia* (*Vesicomya*) *dalli*, n. n. for *Pecchiolia subquadrata*, Dall non Jeffreys ; VERRILL & BUSH, P. U. S. Mus. xx, p. 817.
- Corbicula matannensis*, *possoensis*, Celebes ; SARASIN (402), p. 92, figg. : n. spp.
- Cryptodon insignis*, p. 785, *aqualis*, *planus*, p. 786, *obsoletus*, p. 787, (*Axinulus*, n. subgen.) *brevis*, p. 790, (*A.*) *inaequalis*, (*A.*) *simplex*, p. 791, (*A.*) *pygmaeus*, p. 792, (*A.*) *ovatus*, p. 793, Atlantic coast of N. America ; VERRILL & BUSH, P. U. S. Mus. xx, figg. : n. spp.
- Cyamium falklandicum*, Falkland Islands ; MELVILL & STANDEN, J. Conch. ix, p. 104, fig. : *C. oblongum*, Macquarie Island ; SMITH, P. Malac. Soc. London, iii, p. 24, fig. : n. spp.
- Diplodonta labelliformis*, Gulf of Cadiz, p. 284, *orbiculata*, Monts. MS., Gulf of Gascony ; LOCARD (243), figg. : *D. genethlia*, Persian Gulf ; MELVILL, Mem. Manchester Soc. xlii, No. 4, p. 32, fig. : n. spp.
- Dreissensia*, notes on some species of ; BRUSINA (70).
- Dreissensia baraganica*, Roumania, p. 60, *grimmi*, Caspian, p. 63, *fischeri*, p. 70, Greece, *andrusovi* (Brus. MS.), Caspian, *pallasi*, Aral Sea, p. 80 ; ANDRUSOV, Trudui St. Peterb. Obsch. xxv : n. spp.

- Dreissensiidae* of Europe and N. Asia reviewed and divided into 3 genera *Congerina*, *Dreissensiomya*, and *Dreissensia*; ANDRUSOV (17).
- Issina*, n. gen. for *I. issina*, n. sp., Red Sea; JOUSSEAUME, Naturaliste, 1898, p. 22.
- Kelliopsis*, n. gen. for *Montacuta elevata*, Stimpson; VERRILL & BUSH, P. U. S. Mus. xx, p. 783.
- Leptaxinus*, n. gen. of *Diplodontidae* for *L. minutus*, n. sp., Atlantic coast of N. America; VERRILL & BUSH, t. c. p. 796, fig.
- Lucina* (*Codakia*) *ambigua*, Victoria; BRAZIER, P. Linn. Soc. N. S. Wales, xxiii, p. 272: *L. ignota*, Portugal, p. 276, *appendiculata*, Canaries and N. W. Africa, p. 279; LOCARD (243), figg.: n. spp.
- Montacuta striatula*, p. 780, *casta*, p. 781, *cuneata*, *triquetra*, p. 782, Atlantic coast of United States; VERRILL & BUSH, P. U. S. Mus. xx, fig.: n. spp.
- Mulleria dalyi*, S. India; SMITH, P. Malac. Soc. London, iii, p. 15, fig. [anatomy by WOODWARD, t. c. p. 87]: n. sp.
- Mytilina inaequalis*, S. Australia; DALL, Nautilus, xii, p. 41: n. sp.
- Mytilicardia finchii*, Persian Gulf; MELVILL, Mem. Manchester Soc. xlii, No. 4, p. 30, fig.: n. sp.
- Neolepton sanguineum*, Hutton, note on; BERNARD, Bull. Mus. Paris, iii, p. 313.
- +*Oryctomya*, n. subgen. of *Coralliophaga* for *C. claibornensis*, n. sp., Claiborne sands; DALL, Nautilus, xi, p. 135.
- Pachykellya*, n. gen. for *P. edwardsi*, n. sp., Stewart Island; BERNARD, Bull. Mus. Paris, iii, p. 310, fig.
- Pisidium nitidum*, new variety of; COLES, Sci. Gossip, v, p. 73: *P. fallax* and *P. walkeri*, new varieties; STERKI, Nautilus, xii, pp. 78 & 79.
- Pisidium singleyi*, Mexico, p. 112, *splendidulum*, Michigan and Ohio, p. 114, *abyssorum* (Stimpson MS.), Lake Michigan, p. 124; STERKI, Nautilus, xi: *P. roperi*, United States; STERKI, l. c. xii, p. 77: *P. (Fossarinum) costulatum*, Siberia; WESTERLUND, Ann. Mus. St. Petersb. 1898, p. 180: n. spp.
- +*Prodreissensia*, n. sect. of *Dreissensia* for *P. perrandoi*, n. sp., Tongrian of Liguria; ROVERETO, Atti Soc. Ligustica, ix, p. 174.
- Scintilla eddytonia*, note on; CHASTER, J. Conch. ix, p. 53.
- Spatha cryptoradiata*, Congo Free State; PUTZEYS, Pr.-verb. malac. Belgique, xxvii, p. xxvii, fig.: n. sp.
- Sphaeriidae* of Chicago area; BAKER (24).
- Sphaerium lilycaskense*, Illinois; BAKER, Nautilus, xii, p. 65: *S. boccardi*, *abyssinicum*, Eritrea; POLLONERA, Boll. Mus. Torino, xiii, p. 12, figg.: *S. (Corneola) transversale*, Siberia; WESTERLUND, Ann. Mus. St. Petersb. 1898, p. 179: *S. maroccanum*, Morocco; PALLARY, J. Conchyl. xlv, p. 150, fig.: n. spp.
- +*Sulcocardia*, n. sect. of *Isocardia* for *I. justinensis*, Mayer, Tertiary; ROVERETO, Atti Soc. Ligustica, ix, p. 183.
- Unio asopus*, figured; CALL, J. Cincinnati Soc. xviii, p. 170.
- Unio barys*, Denmark; WESTERLUND, Acta Soc. Faun. Fenn. xiii, p. 160: *U. (Lampsilis) amphicenus*, Louisiana; FRIERSON, Nautilus, xi, p. 109, fig.: *U. triumphans*, Alabama; WRIGHT, t. c. p. 101: *U. reclusus*, Florida; WRIGHT, t. c. p. 111: *U. strodeanus*, Florida; WRIGHT, l. c. xii, p. 5: *U. villosus*, Florida; WRIGHT, t. c. p. 32: *U. iheringi*, Texas; WRIGHT, t. c. p. 93: *U. leopoldvillensis*, Congo Free State; PUTZEYS, Pr.-verb. malac. Belgique, xxvii, p. xxvii, fig.: *U. nieuwenhuisi*, Borneo; SCHEPMAN, Notes Leyden Mus. xx, p. 92, fig.: *U. glenelgensis*, Victoria; DENNANT, P. Soc. Victoria, x, p. 112, fig.: n. spp.
- Unionidae* of Chicago Area; BAKER (24): New varieties; WRIGHT (526).

PSEUDOLAMELLIBRANCHIATA.

- †*Actinochlamys*, n. sect. of *Chlamys* for *C. virgulata*, n. sp., Tongrian of Liguria; ROVERETO, Atti Soc. Ligustica, ix, p. 170.
- Amussium*, on the genus, with *A. edita*, n. n. for *Pecten lucidus*, Jeff. non Goldf., p. 38, *trubinus*, n. n. for *P. similis*, Sby. non Lask., p. 52; GREGORIO (163).
- Chlamys verrilli*, n. n. for *C. benedicti*, Verrill & Bush non Lam.; DOLLFUS, Rev. Paleozool. ii, p. 180.
- †*Cosmetopsis*, n. sect. of *Limopsis* for *L. retifera*, Semper; ROVERETO, Atti Soc. Ligustica, ix, p. 177.
- †*Divaricolima*, n. sect. of *Lima* for *L. eximia*, Giebel, Tertiary; ROVERETO, t. c. p. 167.
- Euvola*, n. sect. of *Pecten*, type *P. ziczac*, L.; DALL, Tr. Wagner Inst. iii, p. 694.
- Hinnites* (?) *absconditus*, P. Fischer MS., Cape Verdes; LOCARD (243), p. 408, fig. : n. sp.
- Lima alata*, Santa Cruz; HEDLEY, Rec. Austral. Mus. iii, p. 84, fig. : *L. (Limatula) leptocarya*, Muscat; MELVILL, Mem. Manchester Soc. xlii, No. 4, p. 28, fig. : n. spp.
- Limatula regularis*, p. 823, *nodulosa*, p. 824, *hyalina*, p. 825, Atlantic coast of N. America; VERRILL & BUSH, P. U. S. Mus. xx, figg. : n. spp.
- Limatulella*, n. subgen. of *Radula* [= *Lima*], for *L. loscombii*, Sby.; SACCO (399), p. 16.
- Limopsis sulcata*, p. 845, *profundicola*, p. 847, Atlantic coast of N. America; VERRILL & BUSH, P. U. S. Mus. xx, figg. : n. spp.
- Meleagrina*, note on; VASSEL (491).
- Nodipecten*, n. sect. of *Pecten*, type *P. nodosus*, L.; DALL, Tr. Wagner Inst. iii, p. 695.
- Ostracea*, notes on the superfam.; DALL, Tr. Wagner Inst. iii, p. 671 et seqq.
- Ostrea townsendi*, Persian Gulf; MELVILL, Mem. Manchester Soc. xlii, No. 4, p. 27, fig. : n. sp.
- Patinopecten*, n. sect. of *Pecten*, type *P. caurinus*, Gould; DALL, Tr. Wagner Inst. iii, p. 695.
- Pecten imbrifer*, new variety; POSSELT, Medd. Grønland, xxiii, p. 13, fig. : *P. subsulcatus*, nom. nov. for *P. sulcatus*, Lamarek non Müller, *P. parvulinus*, n. n. for *P. obliquatus*, Jeffreys non Conrad; LOCARD (243), pp. 387, 402.
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VIII. BRACHIOPODA.

BY

E. R. SYKES, B.A., F.L.S.,

ASSISTED BY

E. A. SMITH, F.Z.S., AND G. C. CRICK, F.G.S.

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IX. BRYOZOA.

BY

FLORENCE BUCHANAN, B.Sc.

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12. —. (2) Appunti sui Briozoi del Mediterraneo. Nota prima. *T. c.* pp. 163–168, 6 figg.
13. PAALZOW, R. Eine neue Bryozoon aus dem Zechsteine. Abh. Ges. Nürnberg, xi, pp. 46 & 47, pl. xiii, figg. 11–21.
14. PEETZ, H. v. Ovozrast ghlínistuiikh slantzev Verkhne-Ul'binskagho forposta na Alta [The age of the argillaceous deposits in the neighbourhood of Werchne-Ulbinsk in West Altai]. Trudui St. Petersb. Obshch. xxviii, 1897, pp. 82–89. German Abstract, pp. 113–115.
15. PENECKE, A. Marine Tertiär-fossilien aus Nordgriechenland und dessen türkischen Grenzländern. Denk. Ak. Wien, lxiv, *Bryozoa*, p. 51.
16. PRATT, E. M. Contributions to our knowledge of the marine fauna of the Falkland Islands. Mem. Manchest. Soc. xlii, No. 13, 26 pp.
17. PRUVOT, —. Catalogue des Invertébrés benthiques du Golfe du Lyon et de la Manche occidentale, avec leur habitat. Arch. Zool. Exp. v, 1897, pp. 617–662.
18. RABITO, L. Ricerche intorno alla formazione dei statoblasti nei Briozoi d' acqua dolce. Natural. Sicil. (n. s.) ii, pp. 131–140, pl. iii.
19. SCHNEIDER, O. Die Thierwelt der Nordsee-Insel Borkum unter Berücksichtigung der von den übrigen ostfriesischen Inseln bekannten Arten. Abh. Ver. Bremen, xxi, *Bryozoa*, p. 164.
20. SCHULTZ, E. *Loxosoma harmeri*, n. sp. Trudui St. Peterb. Obshch. xxv, 1895, Zool. and Physiol. Sect. Pt. II, pp. 49–54, 1 pl. German Abstract, pp. 55–58.

II. BIOLOGY.

HARMER contributes an important paper on the development of the Cyclostomous Polyzoa, shewing by fresh examples that embryonic fission is of common occurrence in the group. He describes the structure of the colony and of the ovicell in *Tubulipora*, introducing the term “œciostome” for the passage by which the larvæ escape from the ovicell, and “œciopore” for the external orifice thereof, dwelling on the classificatory value of these structures. He also describes bud-formation in *Tubulipora*, and some remarkable vesicles in various parts of the polypides and ovicells, which probably have an excretory function, and which increase in number, especially in the tentacles, during the summer. The develop-

ment of the ovicell from the egg in *Tubulipora* is compared with that in *Crisia* and *Lichenopora*.

MAPLESTONE describes the zoœcia of some of the tertiary *Catenicellidae*; NEVIANI (2) the primary zoœcium (ancestrula) of *Microporella* and other Cheilostoma. He also describes a starfish-shaped organism which he considers to be a colony of Bryozoa.

CALVET (1) gives a preliminary account of the development and structure of larva in 15 viviparous species of *Cheilostoma*, and (2) describes the different origins of the polypide in some marine *Cheilostoma* and *Ctenostoma* in the oozoid or in the blastozoid (young or adult), shewing that the same course is not followed in regeneration as in embryonic development.

RABITO describes the formation of statoblasts in freshwater Polyzoa regarding them as buds which remain attached to the alimentary canal of the parent polypide.

III. DISTRIBUTION.

GEOGRAPHICAL.

Marine Forms.

Loch Fyne:—9 spp.; SCOTT, Rep. Fish. Bd. Scotl. xiv, pp. 107–174.

English Channel (Coast of Brittany):—Comparison of spp. with those of Gulf of Lyons: about 50 common to both localities, 45 in the Channel alone, 22 in the Gulf of Lyons alone; PRUVOT.

White Sea:—List of 72 spp. *Ectoprocta*; KHVOROSTANSK, Trudui St. Peterb. Obshch. xxviii, pp. 237, 243 & 244. A n. sp. of *Loxosoma*; SCHULTZ.

Mediterranean:—2 spp. *Microporella* and a peculiar colony of Bryozoa (?); NEVIANI (2).

Falkland Is.:—17 spp. *Cheilostoma* (1 new, and 6 new to Falkland Is.), the further distribution of the other species; PRATT.

New Zealand:—*Ectoprocta*: 110 spp. *Cheilostoma*, 6 of them with more than 1 var., 32 spp. *Cyclostoma*, and 2 spp. *Ctenostoma*; HAMILTON. *Ectoprocta*: *Pedicellina*; HILGENDORF.

Freshwater Forms.

Shetland Is.:—statoblasts of *Cristatella* and of *Plumatella*. Rep. Fish. Bd. Scotl. xiv, p. 242.

Borkum and neighbouring Is.:—*Plumatella*; SCHNEIDER.

France:—Description of 6 spp.; BOSC.

Canaries:—*Plumatella*; RICHARD, C.R. Ac. Sci. xxvi, p. 440.

GEOLOGICAL.

List of Polyzoa in Palæontological Collection, Geol. Dept. Amer. Mus. Nat. Hist. Bull. Amer. Mus. xi, pp. 26–29.

Tertiaries:—Of Italy (Piedmont, p. 34 and p. 98; Liguria, p. 48 and p. 100; Roman provinces p. 106 and Civitavecchia p. 109); NEVIANI (1). Of New Zealand (marine strata): 74 spp. *Cheilostoma* (4 of them with more than 1 var.), 4 spp. *Cyclostoma*; HAMILTON. Of Victoria (marine): several n. spp. of *Catenicellidae*, and a n. g.; MAPLESTONE. Of N. Greece and Turkish boundary—Upper Oligocene—1 g. with 2 spp.; PENECKE.

Palæozoics:—Zechstein formation near Poessneck: a new Bryozoon; PAALZOW. Carboniferous (?): black clays on L. shore of R. Malaja Ubba in West Altai (deep sea deposit), 6 spp.; PEETZ.

IV. SYSTEMATIC.

List of 20 spp. in Museum biol. Lab. St Petersburg; *Izv. biol. Lab. St Petersb.* ii, Pt 3.

A peculiar Bryozoon (?) adhering to fragment of *Posidonia caulini*, on shore at Alassio, 5 zoöcia forming a star-shaped colony; NEVIANI (2), p. 167.

ENTOPROCTA.

Loxosoma harmeri, n. sp., on the elytra of *Harmothoe*, White Sea, p. 55, and list of the 12 other spp., with the animals on which they live, and table to distinguish them; SCHULTZ, *Trudui St. Peterb. Obsch.* xxv, 1895.

L. sp. (? new) on *Phascolion strombi*; BRUMPT, *Arch. Zool. exp.* v, p. 495.

Pedicellina gracilis, Sars, both European varieties in New Zealand; HILGENDORF.

ECTOPROCTA.

GYMNOLÆMA.

CYCLOSTOMA.

"*Idmonea serpens*, L." Harmer 1896 = *Tubulipora plumosa*; HARMER, p. 123.

†*Ptylodictya costellata*, McCoy, in Lower Silurian of Cataluña; ANGELIS.

Tubulipora aperta, n. sp., for *T. fimbria*, Smitt, non Lamk., on fronds of *Laminaria*, Norway, p. 101, and diagnoses and descriptions of *T. flabellaris*, Fabr., p. 99, *T. liliacea*, Pallas, p. 90, *T. phalangea*, Couch, p. 94, and *T. plumosa*, W. Thomps., p. 105; HARMER, *Quart. J. micr. Soc.* xli.

CHEILOSTOMA.

†*Caloporella cordata*, *C. dendrina*, *C. grandis* and *C. rostrata*, n. spp., Muddy Creek, *C. enormis*, n. sp., Balcombe B., and *C. maculata*, n. sp., Moorabool, Victoria, Tertiaries; MAPLESTONE, *P. Soc. Vict.* xi, pp. 16-18.

†*Calpidium morningtoniensis*, n. sp., Balcombe B., Mornington, Victoria, Tertiaries; MAPLESTONE, *l. c.* p. 20.

†*Catinicella elegantissima*, *C. orbicularis*, n. spp., Balcombe B., *C. macgillivrayi* and *C. spenceri*, n. spp., Muddy Creek, Victoria, Tertiaries; MAPLESTONE, *P. Soc. Vict.* xi, pp. 15 & 16.

†*Cellepora decepta*, Wat., in Italian tertiaries, (only known in N. Zealand before), figured; NEVIANI (1), p. 46.

†*Claviporella angusta*, n. sp., (for *C. longicollis*, var. *angusta*, McG.); MAPLESTONE, *l. c.* p. 20.

†*Cribrilina chelys*, Kosch, Italian tertiaries, figured; NEVIANI (1), p. 39.

Microporella plana, n. sp., Mediterranean, and *M. malusii*, Aud., description of first zoöcium (i.e. of the ancestrula); NEVIANI, *Boll. Soc. Rom. Zool.* vii, p. 163.

Porella tridentata, n. sp., Falkland Is.; PRATT, *Mem. Manchest. Soc.* xlii, 13, p. 7.

†*Schizoporella melii*, Nev. var. *miocenica* n. var.; NEVIANI (1), p. 43. †*S. ternate*, Rss., in Pliocene of Bordighera, (only known in Miocene of Nussdorf, Brendola &c. before); NEVIANI, p. 101.

- +*Schizoporellopsis*, n. g., one specimen, consisting of two zoëcia, one with the characters of the *Schizoporellidæ*, the other with those of the *Microporidae*, for *S. abnormis*, n. sp., Muddy Creek, Victoria, Tertiaries; MAPLESTONE, p. 21.
- +*Scorpiodina scorpioides*, Manz, tertiaries, hill near Turin, figured; NEVIANI (1), p. 41.
- +*Strophipora bellis*, n. sp., Bairnsdale, Victoria, Tertiaries; MAPLESTONE, P. Soc. Vict. xi, p. 18.
- +*Thamniscus giganteus*, n. sp., Riffzschstein of Altenburg, near Poessneck; PAALZOW, Abh. Ges. Nürnberg, xi, p. 46.
- +*Vibracella seguenzai*, n. sp., Pliocene of R. Torsero, Liguria; NEVIANI, Boll. Soc. Rom. Zool. vii, p. 103.

CTENOSTOMA.

[No new species.]

PHYLACTOLÆMA.

Plumatella repens, formation of statoblasts; RABITO.

X. CRUSTACEA.

(Including GIGANTOSTRACA AND PANTOPODA.)

BY

ALBERT WILLIAM BROWN, B.A., F.L.S.

Christ Church, Oxford.

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INTRODUCTION.

THE Record of *Crustacea* for 1898 is considerably smaller than for 1897, which contained 41 more papers than the present. Reference to the Systematic list will shew at once that the decline is almost entirely connected with the lower *Crustacea* and in no groups is this more apparent than in *Copepoda*, *Cladocera* and *Ostracoda*, whilst there are no memoirs dealing with *Cumacea* in this year's Record.

On the other hand interest in the higher *Crustacea* is well maintained; no less than 40 papers being concerned with *Decapoda* alone, but on the Biological side fewer papers have been published than for several years past. Lastly attention may be drawn to the small number of volumes dealing with *Crustacea* published during 1898.

Many of the foreign periodicals do not reach the country in time to be incorporated with the Record for their own year. The Recorder prepares this work as a rule in April and the early part of May, all periodicals arriving after that date are not examined till the following year.

The principal notice of the year must be accorded to GIESBRECHT & SCHMEIL's synopsis of the *Copepoda-Gymnoplea* forming the first instalment of the projected *Crustacea* volumes of "Das Tierreich" (70). No attempt has been made to incorporate all the previously known species there described in our Systematic list; but specialists are referred to the work itself, which purports to give diagnoses of all known genera and species of *Crustacea* up to the time of publication. In a few cases generic names have been altered. These alterations are noted in their proper places in the systematic list.

ORTMANN, whose papers are fewer this year than usual, has apparently contented himself with the publication of parts of the *Crustacea* in Bronn's "Klassen und Ordnungen des Thierreichs." He there deals with the Anatomy of the Generative system and with the Embryology of part of the class (107). SARS (124) also continues his admirable "*Crustacea* of Norway." A number of new genera and species are described in the parts numbered ix-xii of Vol. ii, which when completed will embrace the "*Iso-poda* of Norway."

Some few words must now be said as to the progress of our faunistic knowledge during the year. Undoubtedly the region most studied has been the Oriental. BASSETT-SMITH (6-8) has monographed in Ann. Nat. Hist. the *Copepoda* parasitic on Fish from India and surrounding tropical countries. The papers are lengthy and valuable. In addition to these ALCOCK has published the third instalment of "Materials for a Carcinological Fauna of India" (1). This paper deals with the family *Xanthidae* (*Brachyura*) and contains diagnoses of 153 species some of which are new to Science.

BRIAN (34) has compiled a catalogue of *Copepoda* parasitic on Fish from Liguria, which coupled with BASSETT-SMITH's papers referred to above should prove helpful to students of this group. Other Palæarctic *Crustacea* are reviewed by BIRULA (14), who issues a supplemental list of *Decapoda* found in Russian Seas, and by RICHARD (119) and SCHNEIDER (131) both dealing with the fauna of the island of Borkum. BORRADAILE (23) gives us three papers on the *Crustacea* of the South Pacific, NOBILI (104) one on the terrestrial and freshwater *Decapoda* of C. America and ORTMANN (108) one on the *Decapoda* of S. America. Lastly in this connection attention must be drawn to G. S. BRADY's work on the *Ostracoda* of New Zealand (32).

A fair proportion of the papers this year deal with Freshwater *Crustacea*: the following, though embracing other forms as well, may be specially

pointed out:—MAN (99–102), RATHBUN (115–118), VÁVRA (150) (*Ostracoda*) and SARS (127). The last named paper is of exceptional interest as it describes a gigantic Freshwater Ostracod (*Megalocypris*) from S. Africa.

BORRADAILE (24) has revised the *Pontoniidæ* and BOUVIER (29) has published an account of the parasitic *Crustacea* belonging to the genus *Dolops*. COUTIÈRE (40–49) has again a long series of papers on *Alpheidæ*. These cover a good deal of ground. Whilst some are concerned with descriptions of new, and biological notes on already described species, others deal with the development of *Synalpheus laevis* and *Alpheus minus*, and with the phenomenon of regeneration in the genus *Alpheus*.

Isopoda have come in for a good deal of notice during the year. Amongst other papers may be mentioned those of BENEDICT (10 & 11) and DOLLFUS (54–59). The literature of *Cirripedia* this year is somewhat scanty. Only two papers are recorded viz. AURIVILLIUS (4), on the forms collected by the Prince of Monaco, and WELTNER (158), who discusses the nomenclature and synonymy of a single species.

Turning next to embryology we find a number of papers sufficiently diverse in subjects and interesting to merit special notice. WOLTERECK (160) has researched on the structure and development of the Ostracodan egg and deals especially with the eggs of parthenogenetic *Cypridæ*. SARS (128) on the "Propagation and Early Development of *Euphausiidæ*" has published a number of interesting observations and WAGNER has traced to some extent the development of *Neomysis vulgaris* (151). The origin and development of the Mesoderm in *Isopoda* has been studied by NUSBAUM (105) and the development of the Nervous system, Genital cells and Dorsal organ of *Lernæa branchialis* by PEDASHENKO (112). The dorsal organ of embryonic *Crustacea* has also been considered by NUSBAUM & SCHREIBER (106).

Some account of the gills of *Crustacea* is given by KIMUS in *La Cellule* (93). The literature of the Nervous system and Sense organs is not so large this year but a few papers have been written. KELLOG (91) on the divided eyes of *Arthropoda*, SCHREIBER (132) on the peripheral Nervous system and SCHÖNICHEN (134) on a new organ of Hearing seem to be the principal. Another decline has taken place in the number of Physiological papers. Those recorded deal almost exclusively with matters connected with calcification. BOHN (18) has made experiments on the absorption of Carbonic anhydride by *Decapoda* and (19) observations on the seasonal and individual variations in gaseous exchange. GIARD (69) discusses calcification.

The affinities of *Cancer pagurus* with *Atelecyclus heterodon* are stated and discussed by CUNNINGHAM (52) and the habits of various *Crustacea* described by STEAD (138).

BOUVIER, who last year published observations on the *Dorippidæ*, has this year continued the same subject in a work on their classification, origin and distribution (28). WELDON'S (155) address to the British Association on the connection between Variation and Death rate in *Crustacea* revived some discussion on the subject. In this connection CUNNINGHAM (51), GARSTANG (68), HENSLOW (79) and WELDON (156), may be consulted.

BEECHER (9) deals with the Evolution of Spines in all groups of the animal kingdom and so incidentally with the *Crustacea*.

A number of *Phyllopoda* raised from dried mud from S. Africa and New Zealand have been described by SARS (125, 126 & 129) and ATKINSON (2) has made observations on the extraordinary vitality of Entomostraca derived from mud at Jerusalem.

Dr ZACHARIAS, as usual, has a series of papers on Plankton *Crustacea* (163–167).

Papers dealing with extinct forms are more numerous this year. JONES (87 & 88) deals with *Phyllopoda* and in conjunction with Dr HENRY WOODWARD (89) continues their "Monograph of the British Palæozoic *Phyllopoda*." The part published this year describes the genus *Dithyrocaris*. Next to the last named comes CARTER's important study of the Extinct Decapoda of England.

JONES (85) on fossil *Cypridinidæ* and (86) on Triassic *Estheriæ* from Kansas may be mentioned here. WOODWARD (162) has described an exceedingly perfect specimen of *Cyclosphæroma* from the Purbeck Beds of Aylesbury and also (161) a new species of Brachyurous Crustacean from the Upper Greensand. The *Ostracoda* of the Cambridge Greensand are discussed by CHAPMAN (38), and some Miocene *Crustacea* by STUDER (143).

A good popular account of the *Crustacea* is to be found in the series of papers at present being contributed to Knowledge by STEBBING (139).

The literature of *Gigantostraca* and *Pantopoda*, though not calling for any special mention here, is in both cases considerably larger than in 1897.

I. TITLES.*

[For GIGANTOSTRACA see p. 36; for PANTOPODA see p. 40.]

1. ALCOCK, A. Materials for a Carcinological Fauna of India. No. 3. The *Brachyura cyclometopa*. Pt. i, the family *Xanthidæ*. J. Asiatic Soc. Bengal, lxvii, pp. 67-233.
2. ATKINSON, E. Extraordinary vitality of *Entomostraca* in mud from Jerusalem. Ann. Nat. Hist. (vii), ii, pp. 372-376.
3. AURIVILLIUS, C. W. S. Vergleichende thiergeographische Untersuchungen über die Plankton Fauna des Skageraks in den Jahren 1893-1897. Svenska Ak. Handl. xxx, No. 3, 426 pp.
4. ——. *Cirrhépèdes* nouveaux provenant des campagnes scientifiques de S. A. S. le Prince de Monaco. Bull. Soc. Zool. France, xxiii, 1898, pp. 189-198.
5. BARROIS, T. Recherches sur la faune des eaux douces des Açores. Mem. Soc. Lille, Ser. v, Fasc. vi, 172 pp., 3 pls.
6. BASSETT-SMITH, P. W. Some new Parasitic *Copepods* found on Fish at Bombay. Ann. Nat. Hist. vii, i, 1898, pp. 1-17, pls. i-vii.
7. ——. Further new Parasitic *Copepods* found on Fish in the Indo-tropical Region. *Op. cit.* ii, pp. 77-98, pls. iii-vi.
8. ——. Some new or rare Parasitic *Copepods* found on Fish in the Indo-Tropic Region. *T. c.* pp. 357-372, pls. x-xii.
9. BEECHER, C. E. The origin and significance of spines. Amer. J. Sci. vi, pp. 1-20, 125-136, 249-268, & 329-359, pl. i & 73 figg. in text. Abstr. in J. R. Micr. Soc. 1898, p. 619.
10. BENEDICT, J. E. The *Arcturidæ* of the U.S. National Museum. P. Soc. Washington, xii, pp. 41-51, figg. 3-11 in text.
11. ——. Two new Isopods of the Genus *Idotea* from the Coast of California. *T. c.* pp. 53-55, figg. 12 & 13 in text.

* An asterisk prefixed to a quotation indicates that the Recorder has not seen the Journal or Work referred to.

12. BERG, C. Observations sur l'*Aeglea laevis* (Latr.) Leach. Commun. Mus. Buenos Aires, i, No. i, pp. 7 & 8.
13. BIRGE, E. A. Plankton of Lake Mendota. Nature, lviii, p. 259 [Review].
14. BIRULA, A. Materialui dlya biologii i zoogeoghrafi preisnushchestvenno russkikh morei. iv. Dopolnenie k faunye *Crustacea-Decapoda* Byelagho morya. [Biological and Zoogeographical researches principally in the Russian Seas. iv. Supplement to the *Decapod-Fauna* of White Sea.] Annuaire Mus. St. Petersb. 1898, pp. 184-190, tab. i.
15. BLANC, H. Le Plankton Nocturne du Lac Léman. Bull. Soc. Vaudoise, xxxiv, pp. 225-230, pl. ii.
16. BOHN, G. On the Respiration of *Carcinus maenas*, Leach. Ann. Nat. Hist. (vii), i, pp. 17-20.
Translation of a paper in C. R. Ac. Sci. cxxv, pp. 441-444.
17. —. On the Reversal of the Respiratory Current in the *Decapods*. *T. c.* pp. 20-23.
Translation of a paper in C. R. Ac. Sci. cxxv, pp. 539-542.
18. —. De l'absorption de l'anhydride carbonique par les Crustacés Décapodes. C. R. Soc. Biol. Ser. x, v, pp. 1008-1010.
19. —. Variations des échanges gazeux chez les Crustacés Décapodes suivant la saison, l'habitat, la taille des animaux. *T. c.* pp. 1011-1013.
20. —. De l'enfouissement chez les Homaridés et les Thalassinidés. C. R. Ac. Sci. cxxvii, pp. 781-783.
21. BONNIER, J. Sur un type nouveau de Copépode gallicole. *Op. cit.* cxxvi, pp. 769-771.
Abstr. in J. R. Micr. Soc. 1898, p. 423.
22. —. Sur un type nouveau d'Isopode parasite (*Rhabdocheirus incertus*). Bull. Soc. Ent. France, 1898, pp. 198-200, 2 figg. in text.
23. BORRADAILE, L. A. On some Crustaceans from the South Pacific. Pt. I. *Stomatopoda*, pp. 32-38, pls. v & vi. P. Zool. Soc. Lond. 1898. Pt. II. *Macrura anomala*, *t. c.* pp. 457-468, pl. xxxvi. Pt. III. *Macrura*, *t. c.* pp. 1000-1015, pls. lxiii-lxv.
24. —. A revision of the *Pontoniidae*. Ann. Nat. Hist. (vii), ii, pp. 376-391.
Abstr. in J. R. Micr. Soc. 1899, p. 35.
25. —. On a *Cancer pagurus* with supernumerary Chelæ. J. Mar. Zool. ii, 2 pp., pl. viii.
26. BOUVIER, E. L. Observations nouvelles sur les *Blepharopoda*, Randall. (*Albunhippa*, Edw.). Ann. Soc. ent. France, lxvii, 1898, pp. 337-343, 5 figg. in text.
27. —. *Lithadia digueti*, nouveau Crustacé brachyure de la famille des Leucosiidés. Bull. Soc. ent. France, 1898, pp. 330 & 331.
28. —. Sur la classification, les origines et la distribution des crabes de la famille des Dorippidés. Bull. Soc. Philomat. Ser. viii, ix, pp. 54-70.
29. —. Les Crustacés parasites du genre *Dolops*, Audouin. *Op. cit.* x, pp. 53-81, 22 figg. in text.
30. —. Sur le *Blepharopoda fauriana*, Crustacé anomoure de la famille des Hippidés. C. R. Ac. Sci. cxxvii, pp. 566 & 567.

31. BOUVIER, E. L. Sur les Xanthes des mers d'Europe. Feuille Natural. xxviii, pp. 133-137, 9 figg. in text.
——. [See also EDWARDS & BOUVIER (62, 63).]
32. BRADY, G. S. On new or imperfectly known species of *Ostracoda*, chiefly from New Zealand. Tr. Zool. Soc. Lond. xiv, pp. 429-452, pl. xliii-xlvi.
33. BREWER, A. D. A study of the *Copepoda* found in the vicinity of Lincoln, Nebraska. J. Cincinnati Soc. xix, No. 4, Art. xiii, pp. 119-138, pl. vii.
Issued separately also in Stud. Univ. Nebraska.
34. BRIAN, A. Catalogo di Copepodi parassiti dei pesci della Liguria. Atti Soc. Ligustica, ix, pp. 203-229, pls. i-iv.
35. CANU, E. Note sur les Copépodes et les Ostracodes marins des Côtes de Normandie. Bull. Soc. Rouen, 1897, pp. 389-422, pls. iii-x.
——. [See also KERVILLE (92).]
36. CARTER, J. A contribution to the Palæontology of the Decapod *Crustacea* of England. Quart. J. Geol. Soc. liv, 1898, pp. 15-44, pls. i & ii.
37. CECCONI, G. Contributo alla fauna Vallombrosana. Bull. Soc. Ent. Ital. xxx, pp. 145-224.
List of Crustacea, p. 153.
38. CHAPMAN, F. On Ostracoda from the "Cambridge Greensand." Ann. Nat. Hist. (vii), ii, pp. 331-346, 4 figg. in text.
39. CHILTON, C. A new Freshwater Amphipod from New Zealand. Ann. Nat. Hist. (vii), i, pp. 423-426, pl. xviii.
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Brandenburg: *Entomostraca*, etc., p. 140; HARTWIG (75): 2 n. spp. of *Candona*, p. 474; HARTWIG (77).

Borkum: *Copepoda* and *Cladocera*, p. 166; RICHARD (119).

Azores: *Crustacea*; BARROIS (5).

Canaries: incl. n. sp. of *Porcellio*, p. 132; DOLLFUS (58).

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Somaliland: n. sp. of *Potamon*, p. 262; MAN (99).

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Burmah and surrounding districts: *Decapoda* incl. n. sp. of *Parathelphusa*, and 2 n. spp. of *Potamon*; MAN (100).

Senegal: *Isopoda* incl. n. sp. of *Porcellio* and n. sp. of *Mesarmadillo*, p. 122; DOLLFUS (57).

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Behring Sea: *Isopoda*, n. sp. of *Arcturus*, p. 46; BENEDICT (10).

Alaska: *Isopoda*, n. sp. of *Arcturus*, p. 49; BENEDICT (10).

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Atlantic (generally): *Isopoda*, 2 n. spp. of *Arcturus* and 1 of *Astacilla*; BENEDICT (10): *Tanaidæ*, incl. n. spp., p. 35; DOLLFUS (59): *Crustacea*, p. 333; RICHARD (121).

- Norway : *Isopoda* 5 n. spp. incl. *Oniscoida*, *Epicarida* ; SARS (124).
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IV. SYSTEMATIC.*

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MALACOSTRACA.

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* The following signs are used throughout the systematic list :—

† indicates fossil forms.

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- †*Xanthosia granulosa*, p. 37, pl. ii, fig. 5, *similis*, p. 38, pl. ii, fig. 9, Notes ; CARTER, Quart. J. Geol. Soc. liv.
- †*Xanthosia gibbosa*, Notes, p. 37 ; CARTER, t. c.
- †*Zalasius*, n. generic name for *Trichia*, p. 166 ; RATHBUN, P. Soc. Washington, xi.

Zoymus, genus defined, p. 103, key to Indian spp., p. 104, *aeneus*, p. 104, *pilosus*, p. 105 ; ALCOCK, J. Asiat. Soc. Bengal, lxvii.

SCHIZOPODA.

[The following paper relates specially to *Schizopoda* :—WAGNER (151).]

- Heteromysis odontops*, Puget Sound, description and figures, p. 278, pl. xv, figg. 3–6 ; WALKER, Tr. Liverp. biol. Soc. xii, n. sp.
Mysidopsis angusta, occurrence on S. Devon Coast, p. 344 ; HOLT, J. Mar. Biol. Ass., v.
Mysis longicornis, occurrence on S. Devon Coast, p. 344 ; HOLT, *t. c.*
Neomysis vulgaris var. *baltica*, development, description and plates ; WAGNER, Trudui St Peterb. Obsch. xxvi, Zool. Section.

STOMATOPODA.

[The following memoir deals with *Stomatopoda* :—BORRADAILE, Part i, (23).]

- Gonodactylus chiragra*, diagnostic characters etc., p. 34, pl. v, fig. 4, pl. vi, fig. 8, *glabrous*, Rotuma, p. 36 ; BORRADAILE, P. Zool. Soc. Lond. 1898.
G. espinosus, Rotuma, defined, p. 35, pl. v, figg. 5, 5a & b ; BORRADAILE, *t. c. n. sp.*
Protosquilla cerebialis, Rotuma, p. 33, pl. v, fig. 6a, *trispinosa*, Lifu, amended definition, p. 34, pl. v, figg. 1 & 1a ; BORRADAILE, *t. c.*
Pseudosquilla oxyrhyncha, Rotuma, described, p. 37, pl. vi, figg. 9, 9a–d ; BORRADAILE, *t. c. n. sp.*
Squilla multituberculata, Lifu, described, p. 38, pl. vi, figg. 7, 7a–c ; BORRADAILE, *t. c. n. sp.*

EDRIOPTHALMA.

CUMACEA.

(*Vacant.*)

ISOPODA AND ANISOPODA.

[The following papers relate to these groups :—BENEDICT (10, 11), BONNIER (22), DOLLFUS (54–59), HILL (81), RICHARDSON (122), SARS (124), WOODWARD (162).]

- Aega ecarinata*, Florida Coast, p. 39, description and figures ; RICHARDSON, P. Soc. Washington, xii. n. sp.
Anthura carinata, p. 148, pl. ii, figg. 4–19, described ; KUHLGATZ, Wiss. meeresuntersuch. iii.
Arcturus, key to spp., p. 42, *baffini*, p. 43, *feildeni*, p. 44, fig. 3, *americanus*, p. 48, described ; BENEDICT, P. Soc. Washington, xii.
A. longispinis, Atlantic, p. 44, pl. 4, *glabrus*, Behring Sea, p. 46, fig. 5, *beringanus*, Atlantic, p. 46, fig. 6, *tenuispinis*, off Cape San Roque, Brazil, p. 47, fig. 7, *multispinis*, off Galapagos Is., p. 48, fig. 8, *murdochi*, Alaska, p. 49, fig. 9 ; BENEDICT, *t. c. n. spp.*
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Armadillidium, genus defined, p. 188, *vulgare*, p. 189, pl. lxxxii, *opacum*, p. 190, pl. lxxxiii, fig. 1, *pictum*, p. 190, pl. lxxxiii, fig. 2, *pulchellum*, p. 191, pl. lxxxiii, fig. 4, described ; SARS, *t. c.*

- Asellus vulgaris*, preparation and appearance, p. 74, pl. xii, fig. 5 ; TEMPÈRE, Microg. prep. vi.
- Aspidophryxus*, genus defined, p. 227 for *peltatus*, p. 228, pl. xcvi, described ; SARS, Crustacea of Norway, ii.
- Astacilla diomedæ*, Straits of Magellan, p. 50, fig. 10, *cæca*, Atlantic, p. 51, fig. 11 ; BENEDICT, P. Soc. Washington, xii, n. spp.
- Athelges*, genus defined, p. 209, for *paguri*, p. 210, pl. lxxxviii, described ; SARS, Crustacea of Norway, ii.
- A. tenuicaudis*, on *Eupagurus chiroacanthus*, p. 212, pl. lxxxix, fig. 1, *bilobus*, on *E. cuanensis*, p. 113, pl. lxxxix, fig. 3, described ; SARS, *t. c.* n. spp.
- Bopyridæ*, family characterised, p. 195 ; SARS, *t. c.*
- Bopyroides*, genus defined, p. 198, for *hippolytus*, p. 199, pl. lxxxiv, fig. 2, described ; SARS, *t. c.*
- Bopyrus*, genus defined, p. 196, for *squillarum*, p. 197, pl. lxxxiv, fig. 1, described ; SARS, *t. c.*
- Cæcosphæroma burgundum*, subterranean waters of Ardèche, p. 271, figg. ; DOLLFUS, Bull. Mus. Paris, 1898, n. sp.
- +*C. trilobatum*, p. 385, pl. xiv, figg. 1 & 2, description of a new specimen ; WOODWARD, Geol. Mag. v.
- Cylisticus*, genus defined, p. 185, for *convexus*, p. 186, pl. lxxxi, described ; SARS, Crustacea of Norway, ii.
- Cryptoniscidæ*, family characterised, p. 231 ; SARS, *t. c.*
- Cyproniscus*, genus defined, p. 232 ; SARS, *t. c.*
- Dajidæ*, family characterised, p. 221 ; SARS, *t. c.*
- Dajus*, genus defined, p. 222, for *mysidis*, p. 223, pls. xciii & xciv, described ; SARS, *t. c.*
- Eurycope cornuta*, p. 145, pl. lxiv, *producta*, p. 146, pl. lxv, *phallangium*, p. 147, pl. lxvi, *latirostris*, p. 148, pl. lxvii, fig. 1, *furcata*, p. 148, pl. lxvii, fig. 2, *mutica*, p. 149, pl. lxviii, fig. 1, *pygmæa*, p. 150, pl. lxviii, fig. 2, *megalura*, p. 151, pl. lxix, Norway, described ; SARS, *t. c.*
- Eurydice elegantula*, differences from other species of same genus, p. 170 ; WALKER, Tr. Liverp. biol. Soc. xii.
- Haplophthalmus*, genus defined, p. 166, *mengii*, p. 167, pl. lxxiv, fig. 1, *danicus*, p. 168, pl. lxxiv, fig. 2, described ; SARS, Crustacea of Norway, ii.
- Heterotanais algiricus* ♂, Mediterranean, p. 38, fig. 3, *provincialis*, Gulf of St Tropez, p. 39, fig. 4, described ; DOLLFUS, Mem. Soc. zool. France, xi, n. spp.
- Ianira occidentalis*, Puget Sound, description and figures, p. 280, pl. xv, figg. 7-10 ; WALKER, Tr. Liverp. biol. Soc. xii, n. sp.
- Idotea rostrata*, Coast of California, p. 53, fig. 12, *stenops*, Coast of California, p. 54, fig. 13 ; BENEDICT, P. Soc. Washington, xii, n. spp.
- Leptochelia corsica*, Bonifacio, p. 43, fig. 6, *inermis*, Dakar, p. 45, fig. 7, described ; DOLLFUS, Mem. Soc. zool. France, xi, n. spp.
- L. agricola*=*dubia* (Dohrn), synonymy and comparison with *L. savignyi*, p. 41, fig. 5 ; DOLLFUS, *t. c.*
- Leptognatha crassimana*, Brittany, p. 46, fig. 8, described ; DOLLFUS, *t. c.* n. sp.
- Ligia*, defined, p. 155, *oceanica*, p. 156, pl. lxx, described ; SARS, Crustacea of Norway, ii.
- Ligidium*, defined, p. 157, *hypnorum*, p. 158, pl. lxxi, described ; SARS, *t. c.*
- Ligiidæ*, family characterised, p. 155 ; SARS, *t. c.*
- Mesarmadillo senegalensis*, Senegal, p. 122, fig. i, described ; DOLLFUS, Bull. Soc. zool. France, xxiii, n. sp.
- Metoponorthus*, genus defined, p. 183, for *pruinusus*, described, p. 184, pl. lxxx, fig. 2 ; SARS, Crustacea of Norway, ii.
- Microniscus*, genus defined and discussed, p. 218 ; SARS, *t. c.*

- Neotanais edwardsi*, Gulf of Gascony, p. 77, description and figure; DOLLFUS, Bull. Mus. Paris, 1898, n. sp.
- Notophryxus*, genus defined, p. 225, for *ovoides*, p. 226, pl. xcv, described; SARS, Crustacea of Norway, ii.
- Oniscidæ*, family characterised, p. 169; SARS, *t. c.*
- Oniscoida*, tribe discussed, p. 153; SARS, *t. c.*
- Oniscus*, genus defined, p. 170, for *asellus*, described, p. 171, pl. lxxv; SARS, *t. c.*
- Paramunna bilobata*, occurrence in Loch Fyne, p. 56; SCOTT, Ann. Scott. Nat. Hist. 1898.
- Philoscia*, genus defined, p. 172, for *muscorum*, p. 173, pl. lxxvi, fig. 1, described; SARS, Crustacea of Norway, ii.
- Phreatoicopsis terricola*, colour and habits, p. 164; HILL, Victorian Natural, xiv.
- Phryxus*, genus defined, p. 214, for *abdominalis*, p. 215, pls. xc & xci, described; SARS, Crustacea of Norway, ii.
- Platyarthrus*, genus defined, p. 174, for *hoffmannseggi*, p. 175, pl. lxxvi, fig. 2, described; SARS, *t. c.*
- Pleurocrypta*, genus defined, p. 205, *longibranchiata*, described, p. 206, pl. lxxxvi, fig. 2; SARS, *t. c.*
- P. marginata* from branchial cavity of *Galathea dispersa*, p. 207, pl. lxxxvii, fig. 1, *microbranchiata*, in branchial cavity of *G. intermedia*, p. 208, pl. lxxxvii, fig. 2, described; SARS, *t. c.*
- Porcellio*, genus defined, p. 176, *scaber*, p. 176, pl. lxxvii, *pictus*, p. 177, pl. lxxviii, fig. 1, *dilatatus*, p. 179, pl. lxxviii, fig. 2, *rathkei*, p. 180, pl. lxxix, fig. 1, *lævis*, p. 181, pl. lxxix, fig. 2, *ratzeburgii*, p. 182, pl. lxxx, fig. 1, described; SARS, *t. c.*
- P. nodieri*, Senegal, described, p. 124, fig. 2, *lævissimus*, Canaries, described, p. 133, figg. A-C; DOLLFUS, Bull. Soc. zool. France, xxiii, n. spp.
- Pseudione*, genus defined, p. 200, for *affinis*, p. 201, pl. lxxxv, fig. 1, *hyndmanni*, p. 202, pl. lxxxv, fig. 2, described; SARS, Crustacea of Norway, ii.
- P. crenulata*, N. Atlantic, p. 203, pl. lxxxvi, fig. 1, described; SARS, *t. c.* n. sp.
- Rhabdocheirus incertus*, parasitic, p. 198, description and figures; BONNIER, Bull. Soc. ent. France, 1898.
- Sphæromides*, n. g., defined for *raymondi*, Ardèche, p. 36, figg. 1-1 b; DOLLFUS, Bull. Mus. Paris, 1898, n. sp.
- Stenasellus*, n. g., defined for *virei*, Padirac, p. 37, figg. 2-2 a; DOLLFUS, *t. c.* n. sp.
- Tanaïs chevreuxi* ♂, Atlantic, p. 36, fig. 1, *testudinicola*, Mediterranean, p. 37, fig. 2, described; DOLLFUS, Mem. Soc. zool. France, xi, n. spp.
- Trichoniscidæ*, family characterised, p. 159; SARS, Crustacea of Norway, ii.
- Trichoniscoides*, n. g., defined, p. 164, for (*Trichoniscus*) *altidus*, p. 165, pl. lxxiii, fig. 2; SARS, *t. c.*
- Trichoniscus*, genus defined, p. 160, *pusillus*, p. 161, pl. lxxii, fig. 1, *roseus* p. 163, pl. lxxiii, fig. 1; SARS, *t. c.*
- T. pygmaeus*, described, p. 162, pl. lxxii, fig. 2; SARS, *t. c.* n. sp.

AMPHIPODA.

[The following papers deal with *Amphipoda*:—CHILTON (39), WILLEM (159).]

- Aoroides*, n. g., defined, p. 284, for *columbiæ*, Puget Sound, described, p. 285, pl. xvi, figg. 7-10; WALKER, Tr. Liverp. biol. Soc. xii, n. sp.
- Corophium affine*, occurrence in Loch Fyne, p. 240; SCOTT, Ann. Scott. Nat. Hist. 1898. *C. bonellii*, differences of antennæ of ♂ from those of *C. crassicorne*, p. 172; WALKER, Tr. Liverp. biol. Soc. xii.

Dulichia monocantha, occurrence in the Clyde; SCOTT, p. 55, Ann. Scott. Nat. Hist. 1898.

Gammarus pulex, preparation and appearance, p. 74, pl. xii, fig. 4; TEMPÈRE, Microg. Prep. vi.

Hyaella mikiwaka, Mountain streams near Port Chalmers, New Zealand, described, p. 423; CHILTON, Ann. Nat. Hist. (vii), i, n. sp.

Lysianax ceratinus, differences from *L. longicornis*, p. 171; WALKER, Tr. Liverp. biol. Soc. xii.

Mæroides, n. g., defined, p. 282, for *thompsoni*, Puget Sound, described, p. 283, p. xvi, figg. 3-6; WALKER, t. c.

Paramphithoë pacifica, Puget Sound, described, p. 281; WALKER, t. c. n. sp.

Parathemisto abyssorum, in Mesoplankton of Faroe Channel, p. 567; FOWLER, P. Zool. Soc. London, 1898.

Talitroides, n. g., p. 210; WILLEM, Ann. Soc. ent. Belgique, xlii.

LEPTOSTRACA.

(Vacant.)

ENTOMOSTRACA.

[Papers dealing with *Entomostraca* generally are:—ATKINSON (2), DAWSON (53), HARTWIG (75, 76), PRATT (114), RICHARD (120, 121), SARS (129), SCOURFIELD (135), TEMPÈRE (145, 146).]

PHYLLOPODA.

BRANCHIOPODA.

[Cf. JONES (86-88), JONES & WOODWARD (89), SARS (125, 126).]

Apus numidicus, description, development and habits, p. 5, pl. i; SARS, Arch. Naturv. Christian. xx, No. 4.

Branchipodopsis, n. g., for *hodgsoni*, Port Elizabeth, Cape Colony, p. 26, pl. iii, description and habits; SARS, t. c. n. sp.

Branchipus eximius, habits, p. 375; ATKINSON, Ann. Nat. Hist. (vii) ii.

†*Dithyrocaris*, genus defined, p. 129, *glabra*, p. 136, pl. xviii, figg. 1 & 2, xix, figg. 1-4, xxiii, fig. 11, xxv, figg. 1 & 2, *ovalis*, p. 140, pl. xviii, figg. 3a & b, *granulata*, p. 142, pl. xviii, figg. 4-6, xix, figg. 5-6b, xx, figg. 1-3g, *testudinea*, p. 145, pl. xix, figg. 7-9, xxi, figg. 1-6, xxii, fig. 3, xxiii, figg. 7 & 8, xxiv, fig. 7, xxvii, figg. 3a & b, xxviii, figg. 1-5c, xxix, figg. 10-14, xxxi, figg. 1-4, *scouleri*, p. 155, pl. xxi, figg. 7a & b, 10, xxv, figg. 6 & 7, *colei*, p. 163, pl. xxii, fig. 7, xxiii, figg. 1-4, xxiv, figg. 2 & 4, xxv, figg. 9a-c, xxvii, fig. 5, *orbicularis*, p. 168, pl. xxiv, fig. 3, *tricornis*, p. 170, pl. xxii, figg. 4-5e, xxiv, figg. 1, 5 & 6, xxv, figg. 9a-c, xxvii, figg. 2a-c, 4a-e, *belli*, p. 176, pl. xviii, figg. 8a-c; JONES & WOODWARD, Palæozoic Phyllopoda in Pal. Soc. Mon. lii.

†*D. funiculata*, Palæozoic, p. 158, pl. xxii, figg. 6a-d, *insignis*, Palæozoic, p. 159, pl. xxv, figg. 3-5b, xxvii, figg. 1a-c, xxx, figg. 1-3, xxxi, figg. 6-9; JONES & WOODWARD, t. c. n. spp.

Estheria elizabethæ, Port Elizabeth, S. Africa, p. 33, pl. iv, description and habits; SARS, Arch. Naturv. Christian. xx, No. 3, n. sp.

E. gihoni, habits, p. 376; ATKINSON, Ann. Nat. Hist. (vii) ii. +*E. leinsii*, p. 292, *hinderi*, p. 293, measurements and occurrence; JONES, Geol. Mag. v.

- Leptestheria*, n. g., defined, p. 9, for *siliqua*, Cape Town, p. 11, pls. ii & iii, described; Sars, Arch. Naturv. Christian. xx, No. 6, n. sp.
Streptocephalus gracilis, Port Elizabeth, Cape Colony, p. 17, pl. ii, described; Sars, op. cit. No. 3. *S. purcelli*, Cape Town, p. 4, pl. i; Sars, op. cit. No. 6, n. spp.

CLADOCERA.

[The following memoirs relate to *Cladocera*:—DYBOWSKI & GROCHOWSKI (61), RICHARD (119).]

- Acroperus leucocephalus*, p. 38, fig. 3; DYBOWSKI & GROCHOWSKI, Kosmos polski, xxiii.
Alona eucostata, N. Zealand, p. 17, pl. iii, figg. 7–10, *macrocopa*, p. 20, pl. iii, figg. 11–15, described; Sars, Skrift. vid. Christiania, 1894, n. spp.
A. affinis, p. 46, fig. 7; DYBOWSKI & GROCHOWSKI, Kosmos polski, xxiii.
Alonella excisa, var. *miraticiensis*, p. 63, fig. 15; DYBOWSKI & GROCHOWSKI, t. c.
Alonopsis switzeiana, p. 42, fig. 5; DYBOWSKI & GROCHOWSKI, t. c.
Camptocercus rectirostris, p. 40, fig. 4; DYBOWSKI & GROCHOWSKI, t. c.
Ceriodaphnia sublaevis, N. Zealand, p. 14, pl. iii, figg. 1–6, described; Sars, Skrift. vid. Christiania, 1894, n. sp.
Chydorus globiformis, p. 70, fig. 19; DYBOWSKI & GROCHOWSKI, Kosmos polski, xxiii.
Coronatella similis, p. 52, fig. 9; DYBOWSKI & GROCHOWSKI, t. c.
Daphnia thomsoni, N. Zealand, p. 5, pl. i, description and observations; Sars, Skrift. vid. Christiania, 1894.
Dunhevidia syrenopolitana, p. 60, fig. 13; DYBOWSKI & GROCHOWSKI, Kosmos polski, xxiii.
Eurycercus, measurements, p. 36, *polydontus*, measurements and figure, p. 37, fig. 2; DYBOWSKI & GROCHOWSKI, t. c.
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Kurzia nalibokiana, p. 45, fig. 6; DYBOWSKI & GROCHOWSKI, t. c.
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Lynceus nargietewiczii, p. 62, fig. 14; DYBOWSKI & GROCHOWSKI, t. c.
Monospilus kromanensis, p. 72, fig. 20, DYBOWSKI & GROCHOWSKI, t. c.
Oxyurella tenuicaudis var. *polonica*, p. 54, fig. 10; DYBOWSKI & GROCHOWSKI, t. c.
Peracantha truncata, p. 67, fig. 17; DYBOWSKI & GROCHOWSKI, t. c.
Pleuroxus trigonellus, p. 65, fig. 16; DYBOWSKI & GROCHOWSKI, t. c.
Rhypophilus personatus, p. 69, fig. 18; DYBOWSKI & GROCHOWSKI, t. c.
Simocephalus obtusatus, N. Zealand, p. 10, pl. ii, description and occurrence; Sars, Skrift. vid. Christiania, 1894.
Streblocerus minutus, occurrence in Dhu Loch, p. 241; SCOTT, Ann. Scott. Nat. Hist. 1898.

COPEPODA.

[Diagnoses of all genera and known species of *Copepoda-Gymnoplea* will be found in GIESBRECHT & SCHMEIL (70).]

The following papers are concerned with *Copepoda*:—BASSETT-SMITH (6, 7, 8), BONNIER (21), BREWER (33), BRIAN (34), CANU (35), KERVILLE (92), KUHLGATZ (95), RICHARD (119), SCHACHT (130), SCOTT (134).]

Alebian carchariae, description of female from a small shark at Aden, p. 366, pl. xii, fig. 1; BASSETT-SMITH, Ann. Nat. Hist. (vii) ii.

- Anchorella emarginata*, p. 220, pl. iv, fig. 20, *pagelli*, p. 220, pl. iv, fig. 19, *fallax*, p. 221, pl. iv, fig. 23, *hostilis*, p. 221, pl. iv, figg. 28, 28a, *scombri*, p. 221, pl. iv, fig. 21, *uncinata*, p. 221, pl. iv, fig. 24, occurrence and figures; BRIAN, Atti Soc. Ligustica, ix.
- Anuretes perplexus*, on a *Lutjanus* at Trincomalee, p. 89, pl. v, fig. 3, described; BASSETT-SMITH, Ann. Nat. Hist. (vii), ii, n. sp.
- Asterocheres kervillei*, Normandy, p. 406, pl. iii, figg. 2-5, iv, fig. 6, v, figg. 1 & 2, described; CANU, Bull. Soc. Rouen, 1897, n. sp.
- A. parvus*, p. 408, pl. iii, fig. 1, *stimulans*, p. 408, pl. iv, figg. 1-5, description and figures; CANU, t. c.
- Boeckella*, defined, p. 48, *triarticulata*, N. Zealand, p. 49, pls. vii & viii, described; SARS, Skrift. vid. Christiania, 1894.
- Bomolochus tricerus*, in gill cavities of *Stromateus cinereus*, Bombay, p. 2, pl. i, fig. 1, *tetradonis*, gill cavities of *Tetrodon oblongus* at Bombay, p. 4, pl. i, fig. 2; BASSETT-SMITH, Ann. Nat. Hist. (vii) i. *B. denticulatus*, gills of a Garfish, Trincomalee, p. 78, pl. iii, fig. 1; BASSETT-SMITH, Ann. Nat. Hist. (vii), ii, n. spp.
- B. megaceros*, description of the male, p. 358, pl. x, fig. 1, *tenax*, male described, p. 363, pl. xi, fig. 3; BASSETT-SMITH, t. c. *B. cornutus*, p. 207, pl. ii, fig. 12, occurrence in Italy and figures; BRIAN, Atti Soc. Ligustica, ix.
- Brachiella appendiculosa*, gills of fish in Bombay Harbour, p. 14, pl. vi, figg. 1-3; BASSETT-SMITH, Ann. Nat. Hist. (vii), i. *B. multifimbriata*, on a *Serranus* at Muscat, p. 96, pl. vi, fig. 2; BASSETT-SMITH, Ann. Nat. Hist. (vii), ii, n. spp.
- B. neglecta*, described, p. 222, pl. iv, fig. 29, *insidiosa*, occurrence and figures, p. 223, pl. iv, fig. 27; BRIAN, Atti Soc. Ligustica, ix.
- Broteas*, see *Lovénula*, inf.
- Caligodes carangis*, from a *Caranx* at Aden, p. 364, pl. xi, fig. 4; BASSETT-SMITH, Ann. Nat. Hist. (vii), ii, n. sp.
- Caligus parvus*, on surface of *Tetrodon oblongus* in Bombay harbour, p. 5, pl. ii, figg. 1 & 2, *cybii*, gill cavity of *Cybbium lineolatum*, at Bombay, p. 6, pl. ii, fig. 3, *hirsutus*, gill cavity of *Polynemus tetradactylus*, at Bombay, p. 6, pl. iii, figg. 1 & 2, *phipsoni*, gills of *Cybbium guttatum*, at Bombay, p. 7, pl. iii, figg. 3 & 4, *longicaudus*, in gill cavities of two fish in Bombay harbour, p. 8, pl. iv, figg. 1 & 2, *benedeni*, from *Sciænia diacanthus*, at Bombay, p. 9, pl. iv, fig. 3; BASSETT-SMITH, Ann. Nat. Hist. (vii), i. *C. arii*, on a Cat Fish, Ceylon, p. 82, pl. iv, fig. 1, *platytarsis*, on a species of Mugil, Muscat, p. 83, pl. iv, fig. 2, *cossackii*, from gill cavities of *Chrysophorys sarba*, at Bunder Abbas, Persian Gulf, p. 85, pl. iv, fig. 3, *longipedis*, from skin of a *Caranx* at Aden, p. 359, pl. x, figg. 2 & 3, *robustus*, inside operculum of various species of *Caranx* and *Thynnus*, at Trincomalee, p. 361, pl. xi, figg. 1 & 2 described, BASSETT-SMITH, Ann. Nat. Hist. (vii), ii, n. spp.
- C. minutus*, p. 208, pl. ii, fig. 8, *curtus*, p. 208, pl. i, fig. 2, *rapax*, p. 208, pl. ii, fig. 6, *gurnardi*, p. 209, pl. i, figg. 1 & 1a, *vexator*, p. 209, pl. ii, fig. 9, *fissus*, described, p. 209, distribution in Italy and figures; BRIAN, Atti Soc. Ligustica, ix.
- Chondracanthus elongatus*, gills of a Sole, at Bombay, p. 14, pl. vi, figg. 4-6; BASSETT-SMITH, Ann. Nat. Hist. (vii), i, n. sp.
- Cletodes curvirostris*, Normandy, p. 395, pl. vii, figg. 1-3; CANU, Bull. Soc. Rouen, 1897.
- Corycæus anglicus*, Skagerak, p. 40, fig. 9, described, AURIVILLIUS, Svenska Ak. Handl. xxx, No. 3.
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- Monostrilla intermedia*, Skagerak, p. 39, fig. 8, described; AURIVILLIUS, Svenska Ak. Handl. xxx, No. 3, n. sp.
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- Pionodesmotes*, n. g. (?) for *phormosomæ*, on *Phormosoma uranus*, p. 769; BONNIER, C.R. Ac. Sci. cxxvi, n. sp.
- Pleuromma*, see *Pleuromamma*, inf.
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- Pseudoclavella*, n. g., defined, p. 92 for *ovalis*, on gills of a *Serranus* caught at Muscat, p. 95, pl. vi, fig. 1; BASSETT-SMITH, Ann. Nat. Hist. (vii), ii, n. sp.
- Stephos fultoni*, Clyde, p. 185, pl. x, figg. 1-8, xi, figg. 1-4, described; SCOTT, Ann. Nat. Hist. (vii), i, n. sp.
- Tortanus*, nom. nov. for g. *Corynura*, p. 157; GIESBRECHT & SCHMEIL, *Copep-Gymnopl*, in "Das Tierreich," Lief. 6.
- Xanthocalanus fragilis*, Skagerak, p. 32, figg. 4-6, *simplex*, Skagerak, p. 33, fig. 7, described; AURIVILLIUS, Svenska Ak. Handl. xxx, No. 3, n. spp.

OSTRACODA.

[The following memoirs deal specially with Ostracoda:—BRADY (32), CHAPMAN (38), DYBOWSKI & GROCHOWSKI (60), HARTWIG (77 & 78), JONES (85), KERVILLE (92), SARS (127), VÁVRA (150), WOLTERECK (160).]

- Asterope quadrata*, Lyttleton Harbour, p. 432, pl. xlv, figg. 17–21, *grisea*, Akaroa Harbour, p. 432, pl. xliii, figg. 9–14, described; BRADY, Tr. Zool. Soc. Lond. xiv, n. spp.
- A. australis*, New Zealand, p. 431, pl. xliii, figg. 1–8, described; BRADY, *t. c.*
- Candona fragilis*, Brandenburg, p. 474, *protzi*, Brandenburg, p. 476, described; HARTWIG, Zool. Anz. xxi, n. spp.
- C. fabæformis*, VÁVRA = 3 species viz. (1) *Candona fabæformis*, (2) *C. vávrai*, nom. nov., (3) *C. bradyi*, nom. nov., p. 566; HARTWIG, *t. c.*
- Candonella paradisea*, Chili, p. 13, pl. iii, *montevidea*, Uruguay, p. 14, pl. iv, described; VÁVRA, Ergeb. Hamburg. Sammelr. iii, n. spp.
- Candonocypris*, n. g. defined, for part of *Herpetocypris*, Sars, p. 34, *C. candonoides*, N. Zealand, p. 35, pl. v, figg. 1a–c, described; SARS, Skrift. vid. Christiania, 1894.
- C. assimilis*, N. Zealand, p. 36, pl. v, figg. 2a–c, described; SARS, *t. c.* 1894, n. sp.
- Candonopsis falklandica*, Falkland Is., p. 10, pl. ii, described; VÁVRA, Ergeb. Hamburg. Sammelr. iii, n. sp.
- Chlamydotheca symmetrica*, Falkland Is., p. 18, pl. v, described; VÁVRA, *t. c.* n. sp.
- Cyclasterope ovulum*, Stewart Island, p. 432, pl. xliii, figg. 24–30, *tenera*, Lyttleton Harbour, p. 433, pl. xlv, figg. 27–29, described; BRADY, Tr. Zool. Soc. Lond. xiv, n. spp.
- C. zealandica*, Lyttleton Harbour, described, p. 433, pl. xliii, figg. 15–23; BRADY, *t. c.*
- Cypridopsis minna*, N. Zealand, p. 30, pl. iv, figg. 3a–d, *viridis*, N. Zealand, p. 32, pl. iv, figg. 4a–c, descriptions; SARS, Skrift. vid. Christiania, 1894.
- Cyprinotus flavescens*, Dunedin, p. 440, pl. xlvi, figg. 28 & 29, described; BRADY, Tr. Zool. Soc. Lond. xiv, n. sp.
- Cypris viridis*, Dunedin, Shell of female described, p. 440, pl. xlv, figg. 22–24; BRADY, Tr. Zool. Soc. Lond. xiv. *C. bennelong*, N. Zealand, p. 24, pl. iv, figg. 1a–d, *sydneya*, Sydney, p. 27, pl. iv, figg. 2a–c, described; SARS, Skrift. vid. Christiania, 1894.
- †*Cythere subtuberculata*, Cambridge Greensand, p. 337, figg. 3a & b; CHAPMAN, Ann. Nat. Hist. (vii), ii, n. sp.
- C. brunnea*, Lyttleton Harbour, described, p. 442, pl. xlvii, figg. 8–15, *truncula*, Lyttleton Harbour, described, p. 444, pl. xlvii, figg. 16 & 17; BRADY, Tr. Zool. Soc. Lond. xiv, n. spp.
- C. innominata*, n. name for *C. truncata* (Thomson), described, p. 443, pl. xlvii, figg. 1 & 2; BRADY, *t. c.* †*C. gaultina*, var. *excavata*, Cambridge Greensand, p. 336, fig. 2, *koninckiana*, Cambridge Greensand, p. 337, figg. 4a & b; CHAPMAN, Ann. Nat. Hist. (vii), ii.
- †*Entomis pelagica*, Silurian, N. S. Wales, p. 35, *jonesi*, Carboniferous, N. S. Wales, p. 276, pl. xxiv, fig. 6; described, KONINCK, Mem. geol. Surv. N. S. Wales, Pal. No. 6.
- Eupathistoma*, n. g. defined, for *natans*, p. 437, pl. xlv, figg. 21–26, described; BRADY, Tr. Zool. Soc. Lond. xiv, n. sp.
- Ilyodromus*, n. g. for part of *Herpetocypris*, Sars, defined, p. 38, *stanleyanus*, N. Zealand, p. 39, pl. v, figg. 3a–e, *varrovillius*, N. Zealand, p. 41, pl. vi, figg. 1a–c, described; SARS, Skrift. vid. Christiania, 1894.

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- Loxoconcha punctata*, Otago Harbour, description of shell of female, p. 441, pl. xlv, figg. 3-5; BRADY, Tr. Zool. Soc. Lond. xiv, n. sp.
- †*Macrocypris simplex*, Cambridge Greensand, p. 333, figg. 1*a-c*; CHAPMAN, Ann. Nat. Hist. (vii), ii, n. sp.
- Megalocypris*, n. g. defined, p. 4, for *princeps*, Cape Town, p. 5, pl. i; SARS, Arch. Naturv. Christian. xx, No. 8, n. sp.
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- Philomedes sculpta*, description and tendency to develop calcareous concretions on setæ of antennæ and antennules, Otago Harbour, p. 435, pl. xlv, figg. 15-20, *flexilis*, Lyttleton Harbour, description and notes, p. 435, pl. xlv, figg. 1-14, xlv, figg. 15 & 16; BRADY, Tr. Zool. Soc. London, xiv, n. spp.
- †*Polycopse simplex*, Carboniferous, N. S. Wales, p. 275, pl. xxiv, fig. 7; KONINCK, Mem. geol. Surv. N. S. Wales, Pal. No. 6.
- Sarsiella hansenii*, Lyttleton Harbour, p. 438, pl. xlv, figg. 1-12, *hispida*, Akaroa Harbour, p. 439, pl. xlv, figg. 13 & 14, described; BRADY, Tr. Zool. Soc. Lond. xiv, n. spp.
- Trachyleberis*, n. g. defined, p. 444, for *T. (Cythere) scabrocuneata*, Lyttleton Harbour, described, p. 444, pl. xlvii, figg. 1-7 & 18-25; BRADY, *t. c.*
- Xestoleberis luxata*, Lyttleton Harbour, shell of female described, p. 441, pl. xlv, figg. 20-27, *olivacea*, Brighton, N. Z., description, p. 442, pl. xlv, figg. 6 & 7, *compressa*, Brighton, N. Z., description, p. 442, pl. xlv, figg. 10-19; BRADY, *t. c. n. spp.*

CIRRIPIEDIA.

[The following two papers deal with Cirripedia: AURIVILLIUS (4), WELTNER (158).]

- Otion coronularium*, nomenclature and synonymy, p. 381; WELTNER, Zool. Anz. xxi.
- Pæcilasma unguiculus*, Azores, described, p. 194; AURIVILLIUS, Bull. Soc. Zool. France, xxiii, n. sp.
- Scalpellum debile*, p. 189, *rigidum*, *sordidum*, p. 190, *mamillatum*, *anceps*, *molle*, p. 191, *erectum*, *grimaldii*, p. 192, *calyculus*, *falcatum*, p. 193, *incisum*, *pusillum*, p. 194, Azores, described; AURIVILLIUS, *t. c. n. spp.*
- Verruca recta*, *costata*, p. 195, *aqualis*, *inermis*, *crenata*, p. 197, *cornuta*, *sculpta*, p. 197, Azores, described; AURIVILLIUS, *t. c. n. spp.*

GIGANTOSTRACA

i.e., TRILOBITA, XIPHOSURA & EURYPTERIDA.

I. TITLES.

1. BEECHER, C. E. The origin and significance of Spines. Amer. J. Sci. vi, pp. 1-20, 125-136, 249-268, & 329-359, pl. i & 73 figg. in text.
2. BRÖGGER, W. C. Über die Verbreitung der Euloma-Niobe-Fauna (continued). Nyt. Mag. Naturv. xxxvi, pp. 193-240.

3. CLARKE, J. M. As Trilobitas do Grez de Ereré e Maecurú Estado do Pará, Brazil. *Revista Mus. Rio Jan.* i, 1896, pp. 1-58, pls. i & ii.
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—, Mrs, see KONINCK (10).
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7. — & —. *Arthropoda*. Bericht für 1897, 57 pp. *Zool. Jahresber.* 1897.
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9. KAYSER, E. Weiterer Beitrag zur Kenntniss der älteren paläozoischen Faunen Süd-Amerikas. *Zeitschr. Deutsch. geol. Ges.* l, pp. 423-429, pl. xvi.
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11. MATTHEW, G. B. Studies on Cambrian Faunas. *Tr. R. Soc. Canada*, 1897, Ser. 2, Vol. 3, Section iv, pp. 165-203, pl. i-iv.
12. —. Recent Discoveries in the St John Group, No. 2. *Bull. Soc. N. Brunswick*, xvi, 1898, pp. 32-43, figs. in text.
13. —. Some characteristic Genera of the Cambrian. Address at British Association Meeting at Toronto, August, 1897. See *Geol. Mag.* v, 1898, pp. 82 & 83.
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14. MÖBERG, J. C., & MÖLLER, H. Om Acerocarezonen. Ett bidrag till kännedomen om Skånas olenidskiffrar. *Geol. Foren. Stockholm Forh.* xx, pp. 197-286, pls. 10-14.
15. PACKARD, A. S. On the Systematic position of the Trilobites. *P. Amer. Ass.* 1898, p. 365.
16. REED, F. R. C. Notes on the affinities of the genera of *Cheirurus*. *Geol. Mag.* v, 1898, pp. 206-214.
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19. SIEGERT, L. Die versteinerungsführenden Sedimentgeschiebe im Glacialdiluvium des nordwestlichen Sachsens. *Zeitsch. Naturw.* lxxi, pp. 37-138, 8 figs. in text.
20. ZUBER, R. Najdawniejszy s wiat organiczny i nagstarze formacye osadowe. *Kosmos polski*, xxiii, pp. 12-24.

II. BIOLOGY.

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III. DISTRIBUTION.

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Cambrian. *Trilobita*, p. 82; MATTHEW (13). St John Beds: *Trilobita*; MATTHEW (12). n. sp. of *Ptychoparia*; ETHERIDGE, Tr. R. Soc. S. Austral. xxii, p. 1.

Carboniferous. N. S. Wales: *Trilobita*, p. 276; KONINCK (10).

IV. SYSTEMATIC.

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- †*A. ecorne*, p. 231, pl. ix, figg. 1-10, *micropygum*, p. 237, pl. x, figg. 11-18; MOBERG & MÖLLER, *t. c.*
- †*Agnostus nathorsti*, p. 171, pl. i, fig. 2, *fissus*, p. 171, *punctuosus*, p. 172, pls. i-iii, *parvifrons*, p. 172, pl. i, figg. 4a & b, var. *nepos*, pl. i, fig. 5, *umbo*, p. 173, pl. i, figg. 6a & b, *laevigatus*, p. 173, pl. i, fig. 7, described; MATTHEW, Tr. R. Soc. Canada, 1897, iii, Sec. iv.
- †*Agraulos roberti*, p. 177, pl. ii, figg. 4a & b, *nanus*, p. 178, pl. ii, figg. 5a & b, *pusillus*, p. 178, pl. ii, figg. 6a & b, from Cambrian, New Brunswick; MATTHEW, *t. c.* n. spp.
- †*A. ceticephalus*, var. *carinatus*, nov., p. 176, pl. ii, figg. 2a & b, *holocephalus*, p. 176, pl. ii, figg. 3a & b, described; MATTHEW, *t. c.*
- †*Anomocare magnum*, p. 184, pl. iii, figg. 5a-e, *tucer*, p. 198, pl. iv, fig. 8, described; MATTHEW, *t. c.*
- †*Asaphus stacyi*, Silurian, E. Baltic, p. 27, figg. 1 & 2; SCHMIDT, Mem. Ac. St Petersburg. vi, n. sp.
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- †*Bathyriscus senectus*, p. 196, pl. iv, fig. 4, described; MATTHEW, Tr. R. Soc. Canada, iii, Sec. iv.
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- †*Bronteus partschi*, Silurian, N. S. Wales, p. 45, *goniopeltis*, Silurian, N. S. Wales, p. 46, pl. i, fig. 10, described; KONINCK, *t. c.*
- †*Cheirurus insignis*, Silurian, N. S. Wales, p. 38, occurrence; KONINCK, *t. c.*
- †*Conocephalites miser*, p. 200, pl. iv, figg. 7 & 7a, described; MATTHEW, Tr. R. Soc. Canada, iii, Sec. iv.
- †*Conocoryphe pustulosa*, Cambrian, New Brunswick, p. 174, pl. i, figg. 8a & b; MATTHEW, *t. c.* iv, n. sp.

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- †*Cryphaeus paitúna*, Rio Maecurú, p. 39, pl. i, figg. 13, 16 & 17; CLARKE, Revist. Mus. Rio Jan. i.
- †*Dalmanites maecurua*, Rio Maecurú, p. 23, pl. ii, figg. 1-3, 6 & 7, 10 & 15, *australis*, p. 29, pl. ii, figg. 11 & 13, *galea*, p. 31, pl. ii, figg. 4 & 5, *infractus*, p. 34, pl. ii, figg. 8 & 16, *tumilobus*, p. 35, pl. ii, figg. 9 & 12, *gemellus*, p. 38, pl. ii, fig. 14, described; CLARKE, Revist. Mus. Rio Jan. i.
- †*D. gonzaganus*, Paraná, p. 56, descrip. and figg.; CLARKE, *t. c. n. sp. (?)*.
- †*Dolichometopus acadicus*, from Cambrian, N. Brunswick, p. 185, pl. iii, figg. 6a-d; MATTHEW, Tr. R. Soc. Canada, iii, Sec. iv, n. sp.
- †*Dorypyge horrida*, Cambrian, N. Brunswick, p. 190, pl. iv, figg. 3a & b, described; MATTHEW, *t. c. n. sp.*
- †*D. wasatchensis*, n. var. *acadica*, p. 188, pl. iv, fig. 1, *quadriceps*, p. 189, pl. iv, figg. 2a & b, *valida*, p. 189, pl. iv, figg. 2c & d, *parvula*, p. 197, pl. iv, figg. 5 & 5a; MATTHEW, *t. c.*
- †*Encrinurus punctatus*, description, p. 39, *barrandei*, description, p. 40, pl. i, fig. 8, Silurian, N. S. Wales; KONINCK, Mem. geol. Surv. N. S. Wales, Pal. No. 6.
- †*Griffithides eichwaldi*, Carboniferous, N. S. Wales, p. 278, pl. xxiv, fig. 8, described; KONINCK, *t. c.*
- †*Homalonotus oiara*, Devonian, Eréré, p. 5, pl. i, fig. 5, *derbyi*, Rio Maecurú, p. 7, pl. i, figg. 4, 7 & 19, *acanthurus*, Rio Maecurú, p. 11, pl. i, figg. 9 & 10, described; CLARKE, Revist. Mus. Rio Jan. i.
- †*Isotelus*, key to and definitions of Silurian spp. from E. Baltic, p. 33; SCHMIDT, Mem. Ac. St Petersburg. vi.
- †*Liostracus validus*, Cambrian, New Brunswick, p. 179, pl. ii, figg. 7a & b; MATTHEW, Tr. R. Soc. Canada, iii, Sec. iv, n. sp.
- †*Megalaspis*, key to and definitions of Silurian spp. of E. Baltic, p. 35; SCHMIDT, Mem. Ac. St Petersburg. vi. *M. sp.*, Palæozoic, S. America, p. pl. xvi, fig. 1; KAYSER, Zeitschr. Deutsch. Geol. Ges. l.
- †*M. brackebuschi*, Palæozoic, S. America, p. 428, pl. xvi, fig. 3; KAYSER, *t. c. n. sp.*
- †*Niobe*, spp. from Silurian of E. Baltic, p. 35; SCHMIDT, Mem. Ac. St Petersburg. vi.
- †*Parabolina megalops*, Silurian, p. 275, pl. xiii, figg. 1-10; MOBERG & MÖLLER, Geol. Foren. Stockholm Forh. xx, n. sp.
- †*P. acanthura*, p. 259, pl. xii, figg. 1-7, xiv, xv & xvi, *heroes*, p. 267, pl. xii, figg. 8-15, xiv, figg. 10-14; MOBERG & MÖLLER, *t. c.*
- †*Paradoxides abenacus* and form, p. 175, pl. i, figg. 9a-c, ii, figg. 1a-d; MATTHEW, Tr. R. Soc. Canada, iii, 1897, Sec. iv.
- †*Phacops braziliensis*, Rio Maecurú, p. 15, pl. i, figg. 1 & 2, *menurus*, Rio Maecurú, p. 17, pl. i, fig. 15, *scirpeus*, Rio Maecurú, p. 18, pl. i, fig. 6, *pullinus*, Rio Maecurú, p. 20, pl. i, fig. 12, *macropyge*, Rio Maecurú, p. 21, pl. i, fig. 11, described; CLARKE, Revist. Mus. Rio Jan. i.
- †*Phillipsia seminifera*, Carboniferous, N. S. Wales, p. 276, pl. xxiv, fig. 9, described; KONINCK, Mem. geol. Surv. N. S. Wales, Pal. No. 6.
- †*Pterygometopus saltaensis*, Palæozoic, S. America, p. 428, pl. xvi, fig. 4; KAYSER, Zeitschr. Deutsch. Geol. Ges. l, n. sp.
- †*Ptychoparia howchini*, Cambrian, Yorke Peninsula, p. 2, pl. iv, figg. 1-3; ETHERIDGE, Tr. R. Soc. S. Austral. xxii. *Pt. adamsi*, p. 199, pl. iv, fig. 9 described; MATTHEW, Tr. R. Soc. Canada, iii, Sec. iv.
- †*Pt. limbata*, p. 180, pl. iii, figg. 1a-d, *adamsi*, p. 180, pl. iv, fig. 9, narrow form, p. 182, pl. iii, figg. 2a & b, from Cambrian, New Brunswick, described; MATTHEW, *t. c. n. spp.*
- †*Solenopleura arenosa*, p. 182, pl. iv, fig. 10, and p. 199, pl. iv, fig. 10, var. *angilimbata*, p. 183, pl. iii, figg. 3a & b, *robbii*, p. 183, pl. iii, figg. 4a &

- b, arenosa*, p. 199, pl. iv, fig. 10, described; MATTHEW, Tr. R. Soc. Canada, iii, Sec. iv.
 †*Staurocephalus clarkei*, Silurian, N. S. Wales, p. 36, pl. i, fig. 8, described; KONINCK, Mem. geol. Surv. N. S. Wales, Pal. No. 6.
 †*Thysanopyge argentina*, Palæozoic, Argentina, p. 425, pl. xvi, fig. 2; KAYSER, Zeitsch. Deutsch. Geol. Ges. 1, n. sp.

XIPHOSURA and EURYPTERIDA.

(Vacant.)

PANTOPODA.

I. TITLES.

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2. GIESBRECHT, W., & MAYER, P. *Pantopoda*, p. 18, in *Arthropoda*, Bericht für 1896, 67 pp. Zool. Jahresber. 1896.
3. ——— & ———. *Arthropoda*. Bericht für 1897. Zool. Jahresber. 1897. *Pantopoda*, p. 19.
4. SCHÉMKEWITSCH, W. O *Pantopoda* Byelagho morya i Ledovitagho okeana. [The Pantopoda of the White Sea and Arctic Ocean.] Protok. St Peterb. Obsch. xxvii, pp. 132-135. Abstr. in French, p. 145.

III. DISTRIBUTION.

Arctic and White Seas: SCHÉMKEWITSCH, p. 132 & 145 (4).
 Franz Josef Land: CARPENTER (1).
 Normandy Coast: p. 353; KERVILLE, Bull. Soc. Rouen, 1897.

IV. SYSTEMATIC.

- Boreonymphon robustum*, localities in Franz Josef Land, p. 633; CARPENTER, J. Linn. Soc. xxvi.
Chaetonymphon hirtipes, range and localities, p. 631, *macronyx*, localities and notes, p. 632, fig. of Larva, pl. xlvi, figs. 14-16; CARPENTER, *t. c.*
Colossendeis proboscidea, range in Arctic Seas, p. 633; CARPENTER, *t. c.*
Nymphon brevitarse, notes, p. 627, *grossipes*, localities, p. 629, *grossipes*, var. *mixtum*, notes, p. 630, *sluiteri*, p. 630, *longitarse*, localities, p. 631, *elegans*, difference from Sars' figures, p. 631, all from Franz Josef Land; CARPENTER, *t. c.*
Nymphon piliferum, Franz Josef Land, p. 628, pl. xlvi, figg. 1, 3-6, 8, 10-13, described, *piliferum*, var. *abbreviatum*, nov. Franz Josef Land, p. 628, pl. xlvi, figg. 2, 7 & 9; CARPENTER, *t. c.* n. sp.
Pseudopallene spinipes, Franz Josef Land, notes, p. 627; CARPENTER, *t. c.*

XI. ARACHNIDA.

BY

ALBERT WM. BROWN, B.A., F.L.S.

Christ Church, Oxford.

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INTRODUCTION.

THE Record of Arachnida for 1898 contains nearly thirty papers less than that for 1897, but the energy devoted to the description of new species does not, by any means, show a corresponding decline, nor does the method of publishing such descriptions show any tendency to improvement. A great number of immature and imperfect forms are still described as new species, often without sufficient reason. Arachnologists are not of course the only offenders in publishing relatively worthless descriptions. A Recorder who has to deal with several groups of the animal kingdom grows accustomed to seeing the name of a so-called new species with a mark of interrogation before the generic and one after the specific name, for such vagaries are unfortunately only too common. Then again multitudes of descriptions contain no illustrative figures of any kind whatever, and one is tempted to ask of what possible use these will be to systematists twenty years later, when the literature will probably be far more unwieldy than at present. These remarks apply more especially to the Araneæ, with which it is growing, yearly, more difficult to deal. The completion of M. Simon's "Histoire naturelle des Araignées" will be very welcome, for no other list of the genera exists at present and one is greatly needed. One hopes that, before long, the "Araneæ" in "Das Tierreich" will begin to appear too and supply the much-felt want of a systematic list of the entire group.

From a biological point of view 1898 was scarcely so satisfactory a year as 1897. There is a diminution all round in papers dealing with Morphology and kindred subjects. There are some four papers of interest from this standpoint so far as Acari are concerned. BRUCKER (12) deals with the buccal pieces of Acari, and BERLESE has published in the Rivista patalog. veget. two important papers, one, (9), dealing with the Digestive System (of which a notice appeared in last year's Record), and the other a series of notes on Acari interesting from an agricultural point of view (10). CUMMINS (26) has observed *Uropoda* feeding on *Bacteria*.

Two parts of the *Acari* in "Das Tierreich" have appeared. One by MICHAEL (56) gives diagnoses of all known species of *Oribatidæ* up to the time of publication, and the other by NALEPA (57) does the same for *Phytoptidæ*. The compilers of this work have not hesitated to rename several genera where the existing names have previously been used in other groups. The chief alterations are noted in pp. 33-39. These volumes should prove of great help to all systematists, and indeed the idea of the whole work is excellent.

BERLESE (8) continues his "*Acari, Myriop. et Scorp. ital.*" At present this work suffers greatly in usefulness from its somewhat haphazard arrangement. Doubtless the author will remedy this by an index or special directions for binding when the work is complete. A number of new species of *Sarcoptidæ* are described by TROUESSART (112) who also deals with marine Acari (113 & 114). A complete list of European *Phytoptidæ* was published by LEONARDI (48) in 1895 but not seen by the Recorder till this year. PIERSIG (61) continues his monograph of the "*German Hydrachnidæ*" in "*Bibliotheca Zoologica*," dealing principally with the genus *Arrenurus*. Other German *Hydrachnidæ* are described by him in papers Nos. 62-64, whilst in No. 65 he gives an account of a miscellaneous series from various parts of the world. THOR has made contributions to the knowledge of the *Hydrachnidæ* of Norway (105-109), and KRAMER (45) to the *Gamasidæ* of German E. Africa. WOLCOTT (118) has written on the American species of the genus *Atax*, and TROUESSART (111) has described a number of marine *Acari* from Chili.

The smaller groups of *Arachnida* have not had much attention paid them. BANKS (5) on *Phalangida* from Mexico, LOMAN (49) on *Opiliones* from S. Africa and Madagascar, and SIMON (91) on *Pseudoscorpiones* from Italy may be mentioned. An exception to the above statement must be made in the case of *Scorpiones*, which have been dealt with to a considerable extent by POCOCK, KRAEPELIN and others. It will be remembered that a considerable increase in papers dealing with *Scorpions* was noted last year. Some Linnæan type specimens have been discussed by LÖNNBERG (50), whilst the Linnæan species of the genus *Scorpio* are considered by the same author and by KRAEPELIN (42 & 43).

PURCELL (82) has described a number of new S. African Scorpions, and POCOCK a number from E. Africa. The last-named author has contributed the bulk of the literature of *Scorpiones* during 1898, having published seven papers dealing wholly or in part with this group. These are concerned with various forms from Central and South America (68), Ecuador (70), the Solomon Is. (71) and Australian species of the genus *Urodacus* (72). POCOCK has also given us memoirs on the genera *Væjovis* (69) and *Broteas* (73).

The second part of Vol. ii. of SIMON's "*Histoire naturelle des Araignées*" has appeared. This section deals with the families, *Agalenidæ*, *Oxyopidæ*, *Pisauridæ* and *Lycosidæ*. In conjunction with it should be consulted the same author's paper describing various new species and genera belonging to these same families (93).

The publication of Vol. i. of the *Arachnida-Araneida* in *Biologia Centrali-Americana* has been continued by O. PICKARD-CAMBRIDGE, but

no further parts of Vol. ii. by F. O. PICKARD-CAMBRIDGE have as yet appeared. The last-named author continues his series of papers on Cteniform spiders (14).

Arctic spiders collected by the Jackson-Harmsworth Polar Expedition are described by O. P. CAMBRIDGE (18) and from Greenland by SÖRENSEN (102).

Palæarctic *Araneæ* form the subject of a number of papers, and the fauna of this region has been increased or listed by CARPENTER (19 & 22) for Ireland, STRAND (103 & 104) for Norway, HASSELT (35) for Holland, SIMON (92) for Portugal, KULCZYNSKI (47) for Austria, and LUK'YANOV (53) for S. W. Russia.

The spiders described this year from Africa relate principally to the S. and E. parts of that continent. Pocock's papers (66, 74, 76 & 80) should be consulted.

Spiders from Socotra are described by O. PICKARD-CAMBRIDGE (28) and from Trinidad by F. O. PICKARD-CAMBRIDGE (15) who deals also with species from Chili & Peru (13). THORELL continues his account of Burmese forms (110), a number of which are figured and others described by WORKMAN (119) in Malaysian Spiders, Vol. i.

The *Araneæ* of the Australian region are dealt with by Pocock (67) and RAINBOW (83 & 84).

The biological papers though few in number are interesting. WAGNER (116) has given us a paper on "Spermatogenesis in spiders" and BAMBEKE (1) one on the ovum. The poison of spiders is the subject of a contribution by HASSELT (36).

Papers dealing with stridulating organs in a simple fashion are Pocock (81) and CARPENTER (21).

Pocock (78) has also published in "Nature" an interesting account of the habits of *Solpuga*, and KENNEL (38) has made observations on the way spiders stretch their nets between distant points.

The Recorder has endeavoured to improve the section on Distribution in this year's Record and make it more workable. The alphabetical arrangement of the Acari adopted in Vol. xxxiv. has been found to meet all requirements and will therefore be retained.

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4. *Distribution.*

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C. Asia; *Araneæ*, *Lycosa*, n. sp., SIMON (93).

Egypt; *Araneæ*, *Lycosa*, 2 n. spp., SIMON (93).

Arabia; Fao; *Araneæ*, *Thalassius*, n. sp., F. O. P. CAMBRIDGE (14).

3. *Ethiopian Region.*

Africa; *Acari*, 2 n. spp. of *Pterolichus*, TROUESSART (112), pp. 289 & 310.

W. Africa; *Araneæ*, *Ctenus*, n. sp., F. O. P. CAMBRIDGE (14); *Acari*, *Pterolichus*, n. sp., TROUESSART (112).—Cameroons; *Araneæ*, 2 n. spp. of *Ctenus*, F. O. P. CAMBRIDGE (14).—Sierra Leone; *Araneæ*, *Hygropoda*, n. sp., SIMON (93), p. 21.—Senegal; *Araneæ*, *Mizaga*, n. g., SIMON (90), p. 267.—Congo; *Araneæ*, *Hippasa*, n. sp., *Voraptus*, n. sp., *Cispius*, n. sp., *Phalæa*, 2 n. spp., SIMON (93).

C. Africa; *Araneæ*, *Maypaci*, n. sp., SIMON (93), p. 13.

Abyssinia; *Araneæ*, *Zenonina*, n. sp., *Rothus*, n. sp., SIMON (93).

E. Africa; *Scorpiones*, POCOCK (80); *Araneæ*, *Thalassius*, n. sp., *Rothus*, n. sp., and *Hamataliva*, n. sp., SIMON (93); *Gamasidæ*, incl. 3 n. gg. & 4 n. spp., KRAMER (45).—Region of Lakes Nyasa and Tanganyika; *Scorpiones*, *Pedipalpi*, *Araneæ* and *Solifugæ*, POCOCK, (76).—Nyasaland; *Araneæ*, 3 n. spp. of *Lycosa*, *Acanthodon*, n. sp., POCOCK (66), p. 308.—Karagesi; *Araneæ*, *Cyrtarachne*, n. sp. and *Araneus*, n. sp., POCOCK (76).—Mombasa; *Araneæ*, *Ctenus*, n. sp., F. O. P. CAMBRIDGE (14); *Araneus*, n. sp., POCOCK (80), p. 510.—Maziwa Mitatu; *Araneæ*, *Poltys*, n. sp., POCOCK (80), p. 573.—Mbuyuni; *Araneæ*, *Stegodyphus*, n. sp., *Pterinochilus*, n. sp., POCOCK (80).—Ndi; *Araneæ*, *Sparassus*, n. sp., POCOCK (80), p. 519.—Sambaru; *Araneæ*, *Thalassius*, n. sp., *Stegodyphus*, n. sp., *Cænostris*, n. sp., *Argiope*, n. sp.; *Solifugæ*, *Ceroma*, n. sp., *Biton*, n. sp., *Solpuga*, n. sp., POCOCK (80).—Taru; *Araneæ*, 2 n. spp. of *Araneus*, n. sp. of *Acanthodon*; *Solifugæ*, *Zeriassa*, n. sp., *Solpuga*, n. sp., POCOCK (80).—Ugogo; *Araneæ*, *Pterinochilus*, n. sp., POCOCK (80).—Voi; *Araneæ*, n. sp. of *Eucrastoscelus* (n. g.), *Phoneyusa*, n. sp., *Cyrtauchenius*, n. sp., POCOCK (80).—Zomba; *Araneæ*, *Ctenus*, n. sp., F. O. P. CAMBRIDGE (14).

S. Africa; *Scorpiones*, 11 n. spp. of *Oligophthalmus* and n. sp. of *Parabuthus*, PURCELL (82); *Araneæ*, *Ctenus*, n. sp., *Thalassius*, n. sp., F. O. P. CAMBRIDGE (14); *Cybæus*, n. sp., *Campostichomma*, n. sp., *Zenonina*, n. sp., *Artoria*, n. sp., *Pardosa*, n. sp., *Evippa*, n. sp., *Lycosa*, n. sp., 2 n. spp. of *Anomalomma*, *Rothus*, n. sp., 3 n. spp. of *Hahnia*, SIMON (93); *Myro*, n. sp., *Scotussa* (n. g.), n. sp., SIMON (90); *Opiliones*, n. g. & 8 n. spp., LOMAN (49); *Acari*, n. g. of *Hydrachnidæ*, THOR (106).—Kimberley; *Araneæ*, *Rothus*, n. sp., SIMON (93).—Transvaal; *Araneæ*, *Pardosa*, n. sp., *Lycosa*, n. sp., SIMON (93); *Pterinochilus*, n. sp., *Harpactira*, n. sp., POCOCK (66).—Mashonaland; *Araneæ*, *Ctenus*, n. sp., CAMBRIDGE, F. O. P. (14).—Griqualand; *Araneæ*, *Euprosthenops*, n. sp., SIMON (93), p. 12.—Natal; *Scorpiones*, *Pedipalpi* and *Solifugæ*, POCOCK (74); *Araneæ*, *Ctenus*, n. sp., CAMBRIDGE, F. O. P. (14); *Harpactira*, n. sp., *Stegodyphus*, n. sp., *Dresserus*, n. sp., *Dinopis*, n. sp., 5 n. spp. of *Araneus*, *Hersilia*, n. sp., *Spencerella* (n. g.), n. sp., *Palpimanus*, n. sp., *Cydrela*, n. sp., 2 n. spp. of *Platyoides*, *Corinna*, n. sp., *Thomisus*, n. sp., 2 n. spp. of *Sparassus*, POCOCK (74); *Chiracanthium*, n. sp., *Messapus* (n. g.), n. sp., SIMON (90).

Madagascar; *Araneæ*, *Caripeta* (n. g.), n. sp., *Hostus* (n. g.), n. sp., SIMON (90); *Opiliones*, incl. n. g., LOMAN (49); *Acari*; 2 n. spp. of *Pterolichus*, *Dermoglyphus*, n. sp., TROUESSART (112).

Socotra; *Araneæ*, *Nephila*, n. sp., *Gasteracantha*, n. sp., *Tetragnatha*, n. sp., *Selenops*, n. sp., CAMBRIDGE, O. P. (28).

Muscat; *Araneæ*, *Thalassius*, n. sp., CAMBRIDGE, F. O. P. (14).

4. *Oriental Region.*

India, Makim; *Araneæ*, *Thalassius*, n. sp., CAMBRIDGE, F. O. P. (14).

Ceylon, Kandy; *Araneæ*, *Paratus*, n. sp., SIMON (90), p. 210.

Cochin China; *Nilus*, n. sp., SIMON (93), p. 16.

Java; *Araneæ*, *Galliena* (n. g.), n. sp., *Acroniops* (n. g.), n. sp., SIMON (90).

Luzon; *Araneæ*, *Anomalomma*, n. sp., SIMON (93); *Bigois* (n. g.), n. sp., *Palætyra*, n. sp., SIMON (90).

Taprobane Is.; *Araneæ*, 4 n. spp. of *Campostichomma*, 3 n. spp. of *Hahnia*, SIMON (93); 2 n. spp. of *Aviola* (n. g.), SIMON (90).

5. Australian Region.

New Guinea; *Arachnida*, 13 n. spp. & 1 n. g., RAINBOW (84); *Acari*, 6 n. spp., KRAMER (65); 4 n. spp. of *Pterolichus*, *Freyana*, n. sp., *Falciger*, n. sp., 3 n. spp. of *Cheiloceras* (n. g.), TROUESSART (112).—Bismarck Archipelago; *Acari*, 6 n. spp. of *Arrenurus*, PIERSIG (65).

Solomon Is.; *Scorpiones*, *Pedipalpi* and *Araneæ*, incl. n. spp. of the families *Attidæ*, *Heteropodidæ*, *Pisauridæ*, *Ctenizidæ* and *Argiopidæ*, POCOCK (71).

Australia; *Scorpiones*, *Urodacus*, incl. 2 n. spp., POCOCK (72); *Acari*, on Pigeons, n. g., and 2 n. spp. of *Sarcoptidæ*, TROUESSART (114).—Queensland; *Araneæ*, 2 n. spp. of *Anomalomma*, SIMON (93).—Cooktown; *Poltys*, n. sp., RAINBOW (85).—New South Wales; *Araneæ*, RAINBOW (83).

Tasmania; *Araneæ*, *Lycosa*, n. sp., SIMON (93).

New Zealand; *Araneæ*, *Amphinecta*, n. sp., SIMON (90), *Lycosa*, n. sp., SIMON (93); *Acari*, *Pterolichus*, n. sp., *Falciger*, n. sp., TROUESSART (112).

Funafuti and Rotuma; *Arachnida*, POCOCK (67).

Hawai; *Araneæ*, *Lycosa*, n. sp., SIMON (93).

New Caledonia; *Acari*, *Pterolichus*, n. sp., TROUESSART (112).

6. Nearctic Region.

United States;—New Hampshire; *Araneæ*, SOLOSSON (100).—N. Carolina; *Araneæ*, n. sp. of *Cælotis*, SIMON (93).—Florida; *Araneæ*, *Sosippus*, n. sp., *Maypacijs*, n. sp., SIMON (93).—Louisiana; *Araneæ*, *Sosilaus* (n. g.), n. sp., SIMON (90), 2 n. spp. of *Cicurina*, SIMON (93).—Arizona; *Araneæ*, *Nesticus*, n. sp., BANKS (2).—Texas; *Scorpiones*, 2 n. spp. of *Væjovis*, POCOCK (69); *Araneæ*, *Pæcilochoa*, n. sp., *Theridium*, n. sp., BANKS (2).—California; *Araneæ*, *Cybaodes*, n. sp., BANKS (2), *Sosippus*, n. sp., SIMON (93).—Washington; *Araneæ*, *Theridium*, n. sp., *Erigone*, n. sp., *Philodromus*, n. sp., BANKS (2).—Michigan; *Acari*, 7 n. spp. of *Atax*, WOLCOTT (118).

7. Neotropical Region.

Mexico; *Scorpiones*, *Diplocentrus*, n. sp., 5 n. spp. of *Centrurus*, POCOCK (68), 6 n. spp. of *Væjovis*, POCOCK (69).—Guerrero; *Væjovis*, n. sp., POCOCK (68); *Araneæ*, 149 n. spp., BANKS (6); *Opiliones*, 5 n. spp. of *Phalangida*, BANKS (5); *Solifugæ*, 3 n. spp. and n. sp. of *Pseudoscorpiones*, BANKS (6); *Acari*, 3 n. spp., BANKS (6); *Pterolichus*, 2 n. spp., TROUESSART (112).

C. America; *Araneæ*, n. gg. and n. spp., CAMBRIDGE, O. P. (16); *Cicurina*, n. sp., SIMON (93).—Yucatan; *Scorpiones*, *Centrurus*, n. sp., POCOCK (68).—Panama; *Scorpiones*, *Tityus*, n. sp., POCOCK (68); *Araneæ*, *Hesydrus*, SIMON (93).—Costa Rica; *Araneæ*, *Chemnis* (n. g.), n. sp., SIMON (90); *Scorpiones*, *Centrurus*, n. sp., POCOCK (68).

S. America; *Acari*, incl. 17 n. spp., KRAMER (44).—Barbuda; *Scorpiones*, *Centrurus*, n. sp., POCOCK (68).—Trinidad; *Araneæ*, *Lycotenus*, n. sp., *Brachythele*, n. sp., 3 n. spp. of *Theraphosidæ*, *Actinopus*, n. sp., CAMBRIDGE,

F. O. P. (15); *Dossenus*, n. sp., SIMON (93).—Guiana; *Scorpiones*, 2 n. spp. of *Broteas*, Pocock (73); *Acar*i, 3 n. spp. of *Pterolichus*, *Dermoglyphus*, n. sp., *Syringobia*, n. sp., TROUESSART (112).—Ecuador; *Scorpiones*, *Chactas*, n. sp., 5 n. spp. of *Tityus*, 3 n. spp. of *Teuthraustes*, Pocock (70); *Aranee*, *Hygropoda*, n. sp., *Hesydrus*, n. sp., *Trechalea*, n. sp., SIMON (93).—Venezuela; *Aranee*, *Algidus* (n. g.), n. sp., SIMON (90), *Hygropoda*, n. sp., *Hesydrus*, n. sp., *Drances*, n. sp., *Ancylometes*, n. sp., *Architis*, n. sp., SIMON (93), 2 n. spp. of *Symposia* (n. g.), SIMON (94), 2 n. spp. of *Rhoicinus* (n. g.), SIMON (95).—Colombia; *Acar*i, 2 n. spp. of *Dermoglyphus*, TROUESSART (112).—Brazil; *Scorpiones*, *Diplocentrus*, n. sp., Pocock (68); *Aranee*, n. sp. of *Pelidida* (n. g.), SIMON (90), *Emmenophrys*, n. spp., 2 n. spp. of *Schænicoscelis*, *Aulonia*, n. sp., *Hesydrus*, n. sp., *Architis*, n. sp., *Hamataliva*, n. sp., SIMON (93).—Amazons; *Aranee*, *Sisenna*, n. sp., *Lycosa*, n. sp., *Drances*, n. sp., *Ancylometes*, n. sp., *Nilus*, n. sp., *Staberius*, n. sp., SIMON (93).—Chili; *Scorpiones*, 2 n. spp. of *Centrurus*, Pocock (68); *Halacaridae*, TROUESSART (111).—Peru; *Aranee*, *Lycosa*, n. sp., *Staberius*, n. sp., SIMON (93).—Anciven; *Aranee*, *Sparassus*, n. sp., CAMBRIDGE, F. O. P. (13).—Tumbez; *Aranee*, *Amaurobius*, n. sp., CAMBRIDGE, F. O. P. (13).—Corral; *Aranee*, *Rubrinus*, n. sp., CAMBRIDGE, F. O. P. (13).

Juan Fernandez; *Aranee*, *Lycosa*, n. sp., *Meta*, n. sp. and 2 n. spp. of *Tmeticus*, CAMBRIDGE, F. O. P. (13).

IV. SYSTEMATIC.

SCORPIONES.

- Broteas*, discussion of species, p. 98, and key, p. 101, Pocock, Ann. Nat. Hist. (vii), ii.
- B. granimanus*, Dutch Guiana, p. 100, *subgranosus*, British Guiana, p. 100, Pocock, *t. c.*, n. spp.
- Centrurus barbulensis*, Barbuda, p. 386, *ochraceus*, Yucatan, p. 386, *nigrovariatus*, Oaxaca, Mexico, p. 387, *flavopictus*, Jalapa, Mexico, p. 387, *limbatus*, Talamanca, p. 388, *bicolor*, Poyo azul de Pirris, p. 388, *nigrimanus*, Oaxaca, p. 388, *rubricauda*, Costa Rica, p. 389, *nigrescens*, Xantipu, p. 389, *fulvipes*, Mexico, p. 390, *op. cit.* ii, n. spp.
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- Diplocentrus*, key to species, p. 391, Pocock, *t. c.*
- D. rectimanus*, Jalapa, Mexico, p. 390, *politus*, Brazil, p. 390, Pocock, *t. c.*, n. spp.
- Hadogenes pallidus*, Natal, p. 198, Pocock, *op. cit.* ii, n. sp.
- Isometrus europæus*, discussion of type specimen, p. 86, LÖNNBERG, *op. cit.* i.
- Opisthophthalmus*, synopsis of species in S. African Museum, p. 30, PURCELL, Ann. S. African Mus. i.
- O. karrooensis*, S. Africa, p. 1, pl. i, fig. 1, ii, fig. 2, male, female, and young described, *gigas*, S. Africa, ♂ & ♀, p. 5, *flavescens*, Damaraland, p. 7, pl. ii, fig. 3, *fossor*, S. Africa, p. 9, pl. iii, figg. 4 & 4a, *schlechteri*, S. Africa, p. 12, *granicauda*, S. Africa, p. 14, *ater*, S. Africa, p. 16, *leipoldti*, S. Africa, p. 18, pl. iii, fig. 5, *fuscipes*, S. Africa, p. 20, *peringueyi*, Cape Colony, p. 23, *laticauda*, S. Africa, p. 26, pl. iv, fig. 6, described, PURCELL, *t. c.*, n. spp.
- Parabuthus calvus*, S. Africa, p. 28, pl. iv, fig. 7, described, PURCELL, *t. c.*, n. sp.
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- Scorpio afer*, discussion of type specimen, p. 85, LÖNNBERG, *t. c.*
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- Tityus championi*, Bugaba in Panama, p. 385, *pugillator*, N.W. Ecuador, p. 413, fig. 1, *timendus*, Ecuador, p. 414, *rosenbergi*, Ecuador, p. 415, fig. 2, *spinatus*, Ecuador, p. 416, *ecuadorensis*, subsp. *zarumæ*, Ecuador, p. 417, described, Pocock, *t. c.*, n. spp.
- Urodacus*, key to Australian species, p. 65, Pocock, *op. cit.* ii.
- U. granifrons*, W. Australia, ♂ described, p. 62, *hoplurus*, Murchison Goldfields, W. Australia, ♂ described, p. 64, Pocock, *t. c.*, n. spp.
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- Væjovis variegatus*, Mexico, p. 394, *nigropictus*, Mexico, p. 395, *bilineatus*, Texas, p. 395, *nigrescens*, Mexico, p. 396, *subcristatus*, Mexico, p. 396, *cristimanus*, Mexico, p. 397, *crassimanus*, Texas, p. 397, *granulatus*, Mexico, p. 398, *pusillus*, Guerrero, p. 399, described and key-table, Pocock, *t. c.*, n. spp.

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- Tarantula reniformis*, discussion of Linnæan type specimen, p. 89, LÖNNBERG, Ann. Nat. Hist. (vii) i.
- Thelyphonus caudatus*, discussion of Linnæan type specimen, p. 88, LÖNNBERG, *t. c.*

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- Acanthodon*, key-table of African spp., p. 319, *pretoriae*, Pretoria, p. 319, Pocock, Ann. Nat. Hist. (vii) i; *A. robustus*, Taru, British E. Africa, p. 507, Pocock, P. Zool. Soc. London, 1898 : n. spp.
- Actinopus harti*, Trinidad, p. 893, pl. liv, fig. 1, description, CAMBRIDGE, F. O. P., *t. c.*
- Brachythele antillensis*, Trinidad, p. 899, CAMBRIDGE, F. O. P., *t. c.*, n. sp.
- Conothele nigriceps*, Shorland Is., Solomon Is., p. 459, pl. xix, fig. 1, described, Pocock, Ann. Nat. Hist. (vii) i, n. sp.
- Cyrtachenius flaviceps*, Voi, British East Africa, p. 506, Pocock, P. Zool. Soc. London, 1898, n. sp.
- Hapactira curator*, Natal, p. 199, pl. viii, fig. 1, Pocock, Ann. Nat. Hist. (vii) ii, n. sp.

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- Antrochares*, n. g. defined, p. 331, for *macgregori*, Neneba, N. Guinea, p. 332, pl. vii, figg. 2 & 2a, described, RAINBOW, P. Linn. Soc. N. S. Wales, xxiii, n. sp.
- Atypus piceus*, colonies at Hastings, p. 35, JEFFREY, Knowledge, xxi.
- Eucrastoscetus*, n. g. defined for *longiceps*, Voi, British East Africa, p. 501, Pocock, P. Zool. Soc. London, 1898, n. sp.
- Harpactira gigas*, Barberton, Transvaal, p. 316, Pocock, Ann. Nat. Hist. (vii) i, n. sp.
- Hapalopus incei*, Trinidad, p. 895, pl. liv, figg. 8-10 & 12, CAMBRIDGE, F. O. P., P. Zool. Soc. London, 1898, n. sp.
- Idiommata crassipes*, Borrave, N. Guinea, p. 329, pl. vii, fig. 1, *sordida*, Neneba, N. Guinea, p. 330, described, RAINBOW, P. Linn. Soc. N. S. Wales, xxiii.
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- Phoneyusa bettoni*, Voi, British East Africa, p. 503, Pocock, P. Zool. Soc. London, 1898, n. sp.
Pisenorodes, n. g. defined, p. 504, for *Pisenor höhneli*, described, p. 505, pl. xli, figg. 2-2b, Pocock, *t. c.*
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- SIMON, Araignées ii, p. 221, divides the family into the following subfamilies, *Nicodaminae*, *Cybæinae*, *Ageleninae*, and *Hahniinae*. Nat. history of the family, embracing the 4 subfamilies, pp. 218 et seq.
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- Cryphæceæ*, group of *Ageleninæ*, natural history and key to genera, pp. 260–267, figg. 256–271, SIMON, *t. c.*
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- Cycalis*, defined, p. 247, SIMON, Araignées, ii.
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- Hahniinæ*, subfam. of *Agelenidæ*, natural history and key to genera, pp. 270–274, figg. 272–283, SIMON, Araignées, ii.
- Iberina*, defined, p. 277, SIMON, *t. c.*
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- Paradesis*, n. g. defined for *P. tubicola*, Wynberg, S. Africa, within tide-mark in interstices of masses of *Tubicola*, p. 77, figg. 1–3, Pocock, Bull. Liverp. Mus. i, n. sp.
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- Phanotea*, defined, p. 244, SIMON, *t. c.*
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- Scotopsilus*, defined, p. 276, SIMON, Araignées, ii.
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- Bunocrania biloba*, described, p. 374, THORELL, Ann. Mus. Genova, 2^a, ix (xxxix).
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TARDIGRADA.

(Vacant.)

XII. MYRIOPODA AND PROTO-TRACHEATA.

BY

ALBERT WILLIAM BROWN, B.A., F.L.S.

Christ Church, Oxford.

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INTRODUCTION.

THE Record of *Myriopoda* for 1898 is considerably smaller than its predecessors, containing only 39 papers, and of these, 19 are contributed by MM. SILVESTRI and VERHOEFF.

COOK has issued more papers in his publication "Brandtia." The most important of these are "A Revision of the species of *Alipes*" (10) and one dealing with the classification of the *Gomphodesmidae* (9). This includes descriptions of a number of new genera.

During the year additions have been made to our faunistic knowledge, but not so greatly as in former years. VERHOEFF continues his papers on Palearctic *Myriopoda* (33, 35 & 36). SILVESTRI has given us an account of Mediterranean forms (22 & 24), and BRÖLEMANN (5 & 6) continues his lists of French species. BRÖLEMANN'S most important contribution to the literature of 1898 deals with Venezuelan *Myriopoda* (3 & 4), whilst SILVESTRI, also, (21, 23, 27 & 29) has made numerous additions to the list of Neotropical forms.

The only other region which has come under notice is the Australian, and in this connection we note ATTEMS' (1) paper on Australian forms, SILVESTRI'S on those of New Guinea (26) and Queensland (28) and Pocock's report on the *Myriopoda* collected at Funafuti.

SILVESTRI has begun in Rend. Acc. Lincei a series of notes on Diplopodan Morphology. The most interesting of these describes the process of fertilisation in *Pachyiulus communis*. This form is provided with immobile sperms, union between sperm and ovum being effected by means of pseudopodia emitted by the egg. The segmentation of the ovum in the same species is also described.

HEYMONS (15) has given us some account of the development of *Chilopoda*.

BLANCHARD (2) and RAMOS (18) have noted cases of Myriopods parasitic in Man.

There are no other papers calling for special note here and on the whole the nett contribution to our knowledge of *Myriopoda* is somewhat small.

The reverse however is true of the *Prototracheata*. Usually, this group calls for no mention at all in the preface, but thanks to the labours of Dr Willey and M. Bouvier, considerable advance has been made during 1898. Four new species have been described, and it is probable that a revision of the present system of classification will have to be undertaken shortly.

BOUVIER'S (2) paper on the Geographical Distribution and Evolution of the genus is his most interesting contribution. Dr WILLEY has written on the development of *P. novæ-britanniæ* and discussed its bearing on the phylogeny of the Amnion of *Arthropoda* (11).

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31. —. La fecondazione in una specie animale fornita di spermatozoi immobili. Rend. Acc. Lincei, vii, 1^o Semestre, pp. 129–133, 5 figg. in text.

32. SILVESTRI, F. Antwort auf die Bemerkungen des Dr C. Verhoeff (Zool. Anz. No. 555) über meine Note: "Contribuzione alla cognoscenza dei Diplopodi della fauna mediterranea." (Beitrag zur Kenntniss der Diplopoden der mittelländischen Fauna.) Zool. Anz. xxi, 1898, pp. 316-318.
33. VERHOEFF, C. Ueber Diplopoden aus Bosnien, Herzogowina und Dalmatien. Theil iv. *Iulidæ*, pp. 119-160, pls. v & vi. Theil v. *Glomeridæ* and *Polyzoniidæ* (Schluss), pp. 161-176, pl. vii. Arch. Naturg. lxiv, Bd. i.
34. —. Kritisches, systematisch-historisch-litterarisches Verzeichniss der bis Ende 1897 beschriebenen Diplopoden von Oesterreich-Ungarn und dem Occupationsgebiet. *T. c.* pp. 317-334.
35. —. Beiträge zur Kenntniss paläarktischer Myriopoden. vi. Ueber paläarktische Geophiliden, *T. c.* pp. 335-362, pl. viii. vii. Ueber neue und wenig bekannte Polydesmiden aus Siebenbürgen, Rumänien und dem Banat, *T. c.* pp. 363-372, pl. ix.
36. —. Ueber Diplopoden aus Kleinasien. Verh. Ges. Wien, pp. 292-305, pls. iv & v.
37. —. Noch einige Worte über Segmentanhänge bei Insecten und Myriopoden. Zool. Anz. xxi, 1898, pp. 32-39.
38. —. Einige Worte über europäische Höhlenfauna. *T. c.* pp. 136-140.
39. —. Bemerkungen zur neuesten "Contribuzione alla cognoscenza dei Diplopodi" des Dr F. Silvestri. *T. c.* pp. 223-226.

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* In the following list where the character of the reference is not indicated it is to be understood as referring to either description or distribution or both.

- ‡ *Geophilus insculptus*, Steiermark, p. 163, pl. i, figg. 9 & 12, ATTEMS, SB. Ak. Wien, civ; *G. tropicus*, Caracas, descrip., p. 254, pl. xx, figg. 7–10, BRÖLEMANN, Ann. Soc. ent. France, lxvii; *G. pinguis*, Pyrenees, p. 46, figg. 29–32, BRÖLEMANN, Feuille Natural. xxviii; *G. cribelliger*, Trebevic, p. 346, pl. viii, figg. 1–4, *antecribellatus*, Bosnaquelle, p. 347, pl. viii, figg. 4–6, *apfelbecki*, Sarajevo, p. 348, pl. viii, figg. 7–9, *diversiporus*, Jablaniza, p. 348, *pusillus*, *pusillifrater*, Mostar, p. 348, pl. viii, fig. 10, *linearis*, *asiæ-minoris*, Asia Minor, p. 349, pl. viii, figg. 16–19, *conjungens*, Asia Minor, p. 350, pl. viii, figg. 13–15, *flavidus*, *trebevicensis*, p. 350, VERHOEFF, Arch. Naturg. lxiv, Bd. i: n. spp.
- ‡ *Orinomus*, n. g. defined, p. 166, for *oligopus*, Steiermark, p. 167, pl. i, fig. 11, ATTEMS, SB. Ak. Wien, civ, n. sp.
- Orinophilus platensis*, La Plata, described, p. 39, SILVESTRI, Com. Mus. Buenos Aires, i, n. sp.

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STEMMATOIULIDÆ.

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II. BIOLOGY.

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Phylogeny of the Arthropod Amnion, p. 905, WILLEY, Rep. British Ass. 1898.

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XIII. INSECTA.

BY D. SHARP.

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INTRODUCTION.

THE number of memoirs is greater this year than it has ever been, being 1344 compared with 1205 last year and 1264 in 1896, the previous maximum; and the variety of subjects discussed is certainly increasing.

ASHMEAD has given us a review and new classification (25) of *Hymenoptera Sessiliventre*s or *Phytophaga*, and we record a further instalment of considerable extent of LESNE's useful Revision of *Bostrychidæ* (769).

The first volume of the proposed descriptive Catalogue of the *Heterocervus Lepidoptera* of the world has been issued by the British Museum, Natural History (517). It is drawn up by Sir George HAMPSON and indicates that the work will be a very useful one. We have also a revision of the *Pyraustinae* from the same authority (518).

The curious *Diptera* dealt with by DAHL last year and also this year (285) have been treated as a distinct family—*Stethopathidæ*—by WANDOLLECK, who has left the nomenclature in such a state of confusion that we have experienced some difficulty in recording his paper (1283).

We are most pleased to see Captain HUTTON's work at the New Zealand Fauna continued (585–588). According to him (and he is confirmed by other observers) this most important Fauna is rapidly disappearing "and if any record is to be made of them before they vanish, it is quite time that someone should take them in hand." We may hope that if the New Zealand people can be brought to recognise this position of affairs they will liberally and energetically support the efforts of naturalists like Captain Hutton and see that everything is done to obtain as complete a knowledge as possible in the time that remains before the disappearance of the creatures.

PACKARD's Text-book (920) renders available a vast amount of information as to anatomy, physiology and development that has hitherto been inaccessible to the great majority of entomologists, and will prove very useful by drawing attention to aspects that are too much neglected. JANET's papers on the morphology of the segments and the head of the imago (612) inaugurates a discussion of some very important questions. ESCHERICH on the anatomy of *Paussus* (350) is a valuable paper, and is accompanied by observations of the habits as observed in a captive ants' nest. JORDAN's memoir (628) on the antennæ of butterflies and their bearing on classification is so interesting as to make us anticipate with pleasure the promised extension of his observations to other points of the anatomy of these Insects, so extraordinarily neglected from this point of view.

VON IHERING has favoured us with some very remarkable information on the founding of new nests and mushroom-gardens by leaf-cutting ants (591).

Mr and Mrs PECKHAM's observations on the habits and instinct of North American fossorial *Hymenoptera* (932) make a very considerable contribution to the subject, while CUÉNOT's concise study of the means of defence (279) is well worthy of consideration.

PANTEL's contribution to the anatomy, histology and bionomics of the larva of a parasitic fly (927) is of great value. The student of habits will also find some important observations as to the senses and psychical faculties of bees and ants in BETHE's paper (85). The means by which bees find their way home still however remains a complete mystery. Mr GREEN's account (486) of the habits and development of *Diplatys* (*Dyscritina*) is very remarkable. FOREL (403) treats of some social phenomena in ants that he considers require the new name "parabiosis."

The observations and experiments of GRASSI and others (480 etc.) confirm the idea that mosquitoes are important agents in the dissemination of certain diseases.

OUDEMANS (918) has found that it is possible to castrate caterpillars without killing them and has recorded his observations as to the result of this process on their development. If there is no mistake as to the grafting experiments of CRAMPTON (275) they disclose a new method of experiment in Insect-physiology; the colours of one species of *Lepidoptera* having partially appeared on another species that had been grafted. RUHMER has published (1051) some important results from a small series of temperature experiments on *Vanessa prorsa*. REBEL has made observations on the respiration of *Acentropus*-larva and other aquatic caterpillars (995).

The important work of EIMER & FICKERT (344) was by an unfortunate misunderstanding on the part of the Recorder (owing to its being the second "Part II") omitted last year. It contains a discussion of the laws of pattern in *Lepidoptera*, as well as matter of much importance on general questions and a criticism of Weismann. DUBOIS' exposition of luminescence, though far from final, places this difficult subject in a new aspect (317).

BRUYNE's work (147) should be consulted by those interested in the physiology and histology of development. We owe to W. KARAWAIEW an important paper (631) on the post-embryonic development of an ant, *Lasius flavus*, in which the history of the head, thoracic appendages and alimentary canal are treated at length. It is an addition of importance to the data from which we must form our still very imperfect ideas as to the fundamental principles of Insect-metamorphosis. A contribution on the peculiar post-embryonic development of *Mantidæ* by PAVLOFF (931) looks, from the plate, as if it were of considerable interest, but unfortunately it is entirely in Russian.

Perhaps the most remarkable discovery in 1898 was that of PAUL MARCHAL (810), who found that the egg of *Encyrtus fuscicollis* dissociates into a large number of embryos.

CARPENTIER's paper (186) appears to be the best study yet made of the variation of wing-nervuration in any of the great divisions of Insects.

In embryology we have LÉCAILLON's series of papers: the one on the endoderm (751) is of interest to zoologists generally: he maintains a homology of the germinal layers in Insects, but sacrifices the homology of the mesenteron. Miss CLAYPOLE's contribution (211) touches on various points of interest in the embryology of *Anurida maritima*, one of the lowest Insects. UZEL also has a memoir (1260) on the development of *Collembola* and *Thysanura*, and indicates some important points of distinction between the two orders, as well as in regard to their relation to other Insects.

PACKARD's presidential address to the Section of Zoology of the American Association (921) includes some sensible suggestions on early Insect-phylogeny. MEUNIER's paper (850) gives a large number of photographic reproductions of fossil Insects of the secondary period.

We may also call attention to Mr THAXTER's monograph (1204) of Laboulbeniaceæ, the curious small fungi that in some localities infest beetles, and a few other Insects, extensively.

The Recorder regrets that he must again call attention to the necessity of indicating new genera, species and synonyms in a clear manner instead of leaving the novelty to be inferred from incidental remarks or the use of words such as "mihi" or the author's name. The difficulties created by the unsystematic methods of systematists are very great; as an instance we may mention that one new species has been described during the year without adequate indication of the genus to which it belongs.

With regard to enquiries made by certain entomologists as to the inclusion or non-inclusion of articles in the Insecta of the Zoological Record it may be desirable to make the following explanations: (1) the list of titles is not complete, indeed it might be greatly increased each year. A large number of notes are published and exhibitions made that it is unnecessary to place in the list of titles, though most of them are referred to in the proper places in the various subject-indices. (2) As to the date of appearance of a memoir in the volume. The printing of a volume so large as is the Zoological Record cannot be done in a short time; indeed it extends over several months of each year. The Record of Insecta generally goes to press about June in each year. Hence any works that arrive after May cannot be included. When a memoir of any importance is omitted from the volume it should appear in the following volume, or at any rate as soon as the omission is detected. In connection with this point it should be recollected that many Societies are extremely irregular in sending out their volumes after they have been printed. Sometimes volumes are not sent out till long after they have been printed, or are only distributed to a favoured few. Publication is then a gradual affair, not an event that occurs at a particular moment. Frequently also works do not appear at all in accordance with the dates they bear. It is often the case that a work is predated, i.e. bears a date antecedent to that at which it is actually issued. Post-dating also is not infrequent, for it often happens that a copy of a work may be purchased or obtained before the period of which it bears the date. Authors' extras are sometimes issued a year, or even two years, before the work from which they are extracts is published. The 4th part of Reuter's Hemiptera Gymnocerata was recorded in 1894 from a separate copy dated 1891, but the volume from which it was extracted only reached the British Museum in 1899. In such cases it appears impossible to say what is the true date of publication.

From these remarks it is evident that the Record affords no evidence as a test of priority. "Priority" indeed is a much more uncertain matter than most Zoologists believe it to be.

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3. *ACKERMANN. Thierbasterde. I. Theil: Die wirbellosen Thiere. Kassel, 1898.
Cf. Berlin. ent. Zeitschr. xlii, p. 443.
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Summary of Mordwilkow's Russian paper, Zool. Rec. xxxiv, Insecta, Titles (774).

* An asterisk prefixed to a quotation indicates that the Recorder has not seen the Journal or Work referred to.

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Cf. KIEFFER (656) and MARSHALL (824).
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Cf. KONOW (707).
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- 659A. KIEFFER, J. J. Description de deux espèces nouvelles de *Cynipides*. Bull. Soc. ent. France, 1898, p. 142. [*Hymenoptera*.]

II. BIOLOGY.

SUBJECT-INDEX.

1. ANATOMY AND PHYSIOLOGY.

N.B. The arrangement in the following subsections is of little importance as it will be noticed that each of them is not complete in itself.

a. Morphology. (See also "General," below.)

Elements of entomological zoology, PERRIER (942).

Text-book of Anatomy and Physiology, PACKARD (920).

The relation of appendages, legs, cerci, gonapophyses, etc., VERHOEFF (1264), HEYMONS (539).

Morphology of segments of the imago; intersegmental membranes, JANET (611).

Morphology of the head, JANET (612).

Morphology of mouth of *Hemiptera*, SMITH (1149).—Morphology of trophi of fleas, DAHL (286).

Anatomy and morphology of thorax of ants, numerous sections, JANET (610).

Anatomy and morphology of skeleton of *Typhlopsylla* (*Siphonaptera*), N. C. ROTHSCHILD (1042).

Morphology and development of wing-nervures, COMSTOCK & NEEDHAM (262).

b. General (comprehensive) and External. (See also the other subsections.)

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FAUNISTIC: GEOGRAPHICAL DISTRIBUTION.

N.B.—The numbers in brackets refer to "Titles"; by their means it is intended to give a reference to every memoir containing a notice affecting the entomological fauna of each of the twelve regions here adopted. But synonymical notes and changes of systematic position are not included in these references. In addition to giving references to titles of works that actually add to the faunistic record of a region, there are also comprised references to a large number of works on local faunæ, or "stations." The locality in such cases is usually added, and the reference is, as a rule, made direct to the original work, not to our title-numbers, many of these local faunistic notes not being included at all in our list of titles. Frequently a geographical word is also added to the special reference, but this has no value beyond indicating that the paper refers to that locality; a collection of these references with a locality appended would not be complete as regards that locality, for any other references in the same division that have not any particular locality attached may refer also in part to this special locality.

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1. ARCTIC AND ANTARCTIC.

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2. INSULAR (including NEW ZEALAND).

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 Galapagos: *Coleoptera*, LINELL (788).
 Liou-Kiou Is.: *Coleoptera*, BOILEAU (110, 113), PLANET (975), FAIRMAIRE (359).
 Hawaiian Is.: *Hymenoptera*, ALFKEN (11), HOWARD (577); *Coccidæ*, COCKERELL (235).
 "Polynesia" (islands near New Guinea): *Coleoptera*, FAUST (376).
 Admiralty Is.: *Lepidoptera*, ROTHSCCHILD (1045).
 Louisiade Arch.: *Lepidoptera*, GROSE-SMITH (503).
 Fergusson Is., Lifu: *Lepidoptera*, HAMPSON (518).
 Duke York Is., New Hanover, Trobriand Is., New Britain, New Hebrides: *Lepidoptera*, GROSE-SMITH (498).
 New Hebrides, Fergusson Is., New Britain, Solomon Is., New Ireland: *Coleoptera*, FAUST (375).
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 New Britain, Fiji: *Orthoptera*, BRUNNER (146).
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 New Hebrides, New Ireland, New Caledonia, Caroline Is.: *Lepidoptera*, BUTLER (162).
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 Solomon Is., Woodlark Is.: *Lepidoptera*, DRUCE (313).
 Solomon Is., New Caledonia: *Hemipt.-Hom.*, MELICHAR (844, 845).
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- Catalogue of *Coleoptera* of Northern Asia, HEYDEN (538).
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(b.) *Collective Europe.*

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Lepidoptera. WALSINGHAM (1279).

Diptera. KIEFFER (664), MIK (853, 857).

Coccidæ. LEONARDI (768).

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(c.) *British Islands.*

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Hemiptera. MELICHAR, Schleswig Holstein (846).—JOUCK, Belgium, p. 455, Ann. Soc. ent. Belgique, xlii.—Germany, HÜEBER (581), DIEZ, *Eurycera teucris*, p. 329, Jahresh. Ver. Württemberg, liv.—HORVÁTH, Hungary (563).—BIANCHI, Russia (91).

Neuroptera. EATON (339), TUMPPEL, *Odonata* (1243).—KEMPNY, Austria, *Perlidae* (643).—KLAPÁLEK, Hungary, *Trichoptera* (679).—INGENITZKY, E. Europe, *Odonata* (593).—DIEDZIELEWICZA, Poland, Kosmos polski, xxiii, pp. 377–381.

Aptera. KRAUSBAUER, Germany (724).—SCHERBAKOW, Kiew (1071).

(f.) *France* [see also (a.), (b.) and (g.)].

Insecta GADEAU DE KERVILLE, Normandy (437).—ACLOQUE, *Insecta* "Monomorpha" (4).

Coleoptera. ABEILLE (1), BEDEL (60), CROISSANDEAU (276), DESBROCHERS (294), FAUVEL (381), MAYET (835), SAINTE-CLAIRE-DEVILLE (1056, 1057), VITURAT & FAUCONNET (1270).—R. DU BUYSSON, p. 254, Bull. Soc. ent. France, 1898; BEDEL, t. c. p. 329; PIC, p. 13, t. c., and Echange, 1898, pp. 86, etc.; PIERRE, p. 123, Rev. Sci. Bourbon, xi.—RÉGIMBART, Capture de divers *Dytiscides* de France et des Alpes, Bull. Soc. ent. France, 1898, pp. 317–319.—CARPENTIER, North of France, pp. 258–263, Bull. Soc. Nord France, xiii.—BENDERITTER, Normandy, *Rhizotrogus cicatricosus*, Bull. Soc. Rouen, xxxiii, p. 47.—BEDEL, Paris, p. 285, Bull. Soc. ent. France, 1898.—BEDEL, Compiègne, pp. 277, 278, t. c.—LÉVEILLÉ, Fontainebleau, p. 253, t. c.; L'Ain, CARRET, p. 58, Echange, 1898; Seine-et-Oise, LÉVEILLÉ, p. 214, Bull. Soc. ent. France, 1898.—Allier, Supplément aux *Coléoptères*, OLIVIER, Rev. Sci. Bourbon, xi, pp. 57–62.—Catalogue des Insectes *Coléoptères* trouvés jusqu'à ce jour dans le département de l'Aude; deuxième partie, *Staphylinidæ*, Bull. Soc. Aude, ix, pp. 97–124.—Pyrénées-Orientales, LESNE, Bull. Soc. ent. France, 1898, p. 306.

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Diptera. KIEFFER (657), PANDELLÉ (926), VILLENEUVE (1269).—YERBURY, Hyères, pp. xvii–xix, P. ent. Soc. London, 1898.

Hemiptera. EDWARDS (341), THEN (1205).—Seine-et-Oise, MARTIN, p. 214, Bull. Soc. ent. France, 1898.—LESNE, Paris, p. 213, *t. c.*—Supplément au Catalogue des Hémiptères de la Somme, DUBOIS, pp. 229–240, Mem. Soc. Nord France, ix.—LAMBERTIE, Gironde, pp. xcii, xciii, Act. Soc. Bordeaux, liii.

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Collembola. DUBOIS (317).

(g.) *Southern Europe and Mediterranean Basin* [see also (a.), (b.) and (f.).]

Insecta. FUENTE, Spain, Actas Soc. espan. 1898, pp. 205, 206.—Italy, GRIFFINI (494).—Vallombrosa, *Hemiptera* and *Diptera*, CECCONI, pp. 3–12, Bull. Soc. ent. Ital. xxx.—LANGHOFFER, Dalmatia, Glasnik Naravosl. Drust. ix, pp. 346–358.—MEUNIER, N. Bulgaria (*Hym.* and *Dipt.*), Ann. Soc. Bruxelles, xxii, pp. 348–350.

Coleoptera. FAUVEL (379), PIC (967), SCHULTZE (1088).—HOWARD, Portugal (570).—Spain, ESCALERA (349), FUENTE (435), LAUFFER (752), UHAGON (1249, 1250); Gibraltar, CHAMPION (196).—Andalusia and Algeria, PIC (958).—N. Africa, ABEILLE (2), BUYSSON (164, 165).—Algeria, CHABAUT (204, 206), CLOUET (215), D'ORBIGNY (906), PIC (950), SEIDLITZ (1106).—DESBROCHERS, Barbary (295).—Sahara, VAULOGER (1262).—Caucasus and N. Africa, DESBROCHERS (292).—DESBROCHERS, Palma (293).—RÉGIMBART, Balearic Isles (1000).—Italy, DODERO (308), GESTRO (453); Rocciamelone, RONCHETTI, p. 72, Boll. Naturalist. xviii.—Bormio, RONCHETTI, pp. 45–47, 77–81, Riv. ital. Sci. Nat. xviii.—Catalogo ragionato dei Coleotteri di Sicilia (*Heteromera*), RAGUSA, pp. 105–130 and 197–237.—RAGUSA, Sicily, pp. 257–260, Natural. Sicil. (2) ii.—SPAETH, Croatia (1168).—Bosnia, WASMANN (1304).—Roumania, SPAETH, p. 658, Verh. Ges. Wien, 1898; JAQUET, pp. 52–56, 185–187, 493–495, Bull. Soc. Bucarest, vii.—Asia Minor, ROESCHKE (1039), ESCALERA, pp. 150, 151, Actas Soc. espan. 1898.—FORMANEK, Armenia (404).—H. DU BUYSSON, Anatolia (166).—Anatolia and Syria, PIC (961).—Syria, PIC (948, 955), REITTER (1014), ROESCHKE (1039).—Egypt, BUYSSON (165).

Hymenoptera. ANDRÉ (16), BUYSSON (167), KIEFFER (659), STEFANI (1180).—Datos para el conocimiento de la fauna himenopterológica de Portugal, MEDINA, pp. 152–154, 284, Actas Soc. espan. 1898.—Bilbao, *Tenthredinidae*, SEEBOLD, p. 29, *t. c.*—Spain, KRIECHBAUMER (728, 731).—N. Africa, HANDLIRSCH (527).—Algeria, ANDRÉ (17), PIC (959).—Italy and Alg., KIEFFER, Bull. Soc. ent. France, 1898, p. 142.—Algeria, Asia Minor, KONOW (705).—Sicily, STEFANI (1181).—Italy, MANTERO (809).—Bosnia and Algeria, KONOW (701).—Triest, DUCKE (319).—Asia Minor, KONOW (698).—Egypt, FRIESE (417).

Lepidoptera. MATHEW, pp. 77–84, 108–116, Entomologist, 1898.—Spain and Portugal, SEEBOLD (1104).—Spain, SEEBOLD (1105), GRIMSHAW, p. 54, Ent. Mag. 1898.—Corsica, WALSINGHAM (1280).—Algeria, CHRÉTIEN (210), OBERTHÜR (898), *Micro-Lepidoptera*, OLIVIER, pp. 145–147, Feuille. Natural. xxviii.—Piedmont, TUTT, pp. 89, etc., Ent. Rec. x.—Val Cavallina, *Rhopalocera*, G. A., pp. 4, 5, Boll. Naturalist. xviii.—Servia, LAZAREVITA, Ghlas Srpska Ak. lvi, 1898, pp. 185–235.—Syria, HOFMANN (543).—Jerusalem, SWINTON, pp. 181–184, Ent. Mag. 1898.—Caucasus, Taurus and Syria, SEEBOLD (1103).

Diptera. MIK (856).—Portugal, MIK (854).—Spain, STROBL (1198).—Italy, BEZZI (89).

Hemiptera. PUTON (985).—Algeria, HORVÁTH (560), KIEFFER (660).—Sicily, RAGUSA, Natural. Sicil. (2) ii, pp. 246–249.—Syria, MONTANDON (866).—Egypt, BERGROTH (74).

Coccidæ. Italy, BUFFA (148).

Neuroptera. Algeria, McLACHLAN (837).—Monza, ALBANI, pp. 113, 114, Boll. Naturalist. xviii.—Bosnia, McLACHLAN, p. 248, Ent. Mag. 1898.

Orthoptera. BOLIVAR, Catologo sinóptico de los Ortópteros de la fauna ibérica, continued (118).—Sierra de Segura, BECERRA, p. 41, Actas Soc. espan. 1898.—Morocco, BOLIVAR (119).—Algeria, BURR, pp. 177–180, Ent. Mag. 1898.—Beiträge zur Kenntniss der Orthopteren-Fauna der Hercegovina, WERNER, pp. 153–156, Verh. Ges. Wien, 1898.—Roumania, BURR (151).—S. E. Europe, BURR, p. 267, etc., Ent. Rec. x.

(h.) *Caucasus and West and Central Asia, including Arabia* [see also (a.) and (b.), and for *Caucasus* (e.)]: for *Thibet* see 6.

Insecta. Socotra, DIXEY & BURR (305).—Centr. Asia, SAHLBERG (1055).

Coleoptera. FLEISCHER (393).—Persia, JAKOWLEFF (606), PIC (965, 968), REITTER (1016).—Persia, SEMENOW (1113), TSCHITSCHÉRINE (1234).—Black Sea and Caucasus, CARRET (187).—Transcaucasus, HAURY (531).—Caucasus, PIC (956), REITTER (1015), SEMENOW (1109).—Lenkoran, REITTER (1012).—Kirghisia, KERREMANS (646).—W. Asia, and Tibet, SEMENOW (1116).—Aden, KERREMANS (646).—Mesopotamia and Arabia, ORBIGNY (907, 908).

Hymenoptera. Caucasus, KONOW (702).—Caspian, KONOW (706).—Aden, BINGHAM (95).

Lepidoptera. Central Asia, PÜNGELER (984).

Diptera. Aden, VERRALL (1265).

Neuroptera. Arabia, KOLBE (691).

Orthoptera. ZUBOWSKY (1343, 1344).

4. AFRICA (TROPICAL & SOUTH; for NORTH AFRICA, see 3 (g.); for COMORO Is., see 5). ARABIA and SOCOTRA, see 3 (h.).

Insecta. ANSORGE (23).

Coleoptera. *Cryptarcha camptoides* is not African, GROUVELLE, p. 374, Ann. Soc. ent. France, lxxvii.

Coleoptera. BELON (62, 63), BRAUNS (136), BRENSKE (142, 143), DISTANT (301), FAIRMAIRE (361, 363, 367), FAUST (373, 378), FLEUTIAUX (397), GAHAN (439), GESTRO (456, 457), GRIFFINI (492), GROUVELLE (509), HORN (554, 556), JACOBY (597, 600, 604), KERREMANS (647, 648), KOLBE (689, 690, 692), KRAATZ (710, 712, 715, 716, 719), LESNE (769, 771), LÉVEILLÉ (776), LEWIS (778), PÉRINGUEY (935, 937, 939, 940), PIC (946, 960, 962, 963, 964, 966, 969, 970), RAFFRAY (988, 989, 990, 993), SCHENKLING (1070),

SCHILSKY (1073), SCHOCH (1078), SCHWARZ (1092, 1093, 1094, 1096), SEIDLITZ (1107, p. 441), SENNA (1119, 1122), SPAETH (1167), THÉRY (1209), THOMAS (1210), TSCHITSCHÉRINE (1231, 1232, 1234, 1235, 1236, 1238), WASMANN (1301, 1302, 1303), WATERHOUSE (1307), WEISE (1312, 1314, 1315, 1316, 1317).

Hymenoptera. ANDRÉ (16), BUYSSON (167, 170, 171), EMERY (346), HOWARD (577), KIRKALDY (671), KOHL (685, 686), MAGRETTI (806, 807), PÉRINGUEY (938), VACHAL (1261).

Lepidoptera. AURIVILLIUS (30, 32).—BARRETT, pp. 238–242, *Ent. Mag.* 1898.—BUTLER (152 to 157, 163) and *P. Z. S.* 1898, pp. 823, 825.—DISTANT, Transvaal, "Cape Subregion" (298), DISTANT (299, 300), DRUCE (313, 314), GROSE-SMITH (499, 501), HAMPSON (517, 518, 521), HOLLAND (547), KARSCH (632, 633, 637, 638), ROTHSCHILD (1044, 1047), SHARPE (1132, 1134), TRIMEN (1222), WARREN (1287, 1288).

Diptera. BRAUER (135), HOUGH (564), JOHNSON (620), WANDOLLECK (1283).

Hemiptera. BREDDIN (138), DISTANT (302, 303), JONCK (624), MELICHAR (844, 845), MONTANDON (869, 870), NOUALHIER (892).

Coccidæ. COCKERELL (236), COOLEY (263), NEWSTEAD (884).

Neuroptera. BAUMANN (58), FÖRSTER (405), KIRBY (669), KOLBE (691), McLACHLAN (839), SJÖSTEDT (1140, 1141).

Orthoptera. KARSCH (635, 638), MARTINEZ (828), SAUSSURE (1061).

5. MADAGASCAR, including SEYCHELLES and MASCARENE Is.

Insecta. Mauritius, EMMEREZ (348).

Coleoptera. ALLUAUD (13).—ALLUAUD, Mascarene and Seychelle islds. (14).—DONCKIER, p. 362, *Bull. Soc. ent. France*, 1898.—FAIRMAIRE (362, 364, 365, 366, 368, 369, 370), FAUVEL (382).—FAUVEL, Seychelles (380).—HORN (552).—JACOBY, Mauritius and Réunion (596).—KERREMANS (649), LESNE (769), LÉVEILLÉ (777).—PIC, Mascarene Is. (949).—PIC, Madagascar and Mauritius (957).—PIC (960, 963), RAFFRAY (990), SCHOCH (1078), SCHWARZ (1092), THÉRY (1209), TSCHITSCHÉRINE (1234, 1240).

Hymenoptera. ANDRÉ (16), BUYSSON (171).—GIARD, Réunion (463).—GROSE-SMITH (501), HAMPSON (518), SHARPE (1132), WARREN (1287).

Hemiptera. BREDDIN (138), KIRKALDY (676).—MELICHAR, Madagascar, Mauritius (844, 845).

Coccidæ. Mauritius, EMMEREZ (347).

Odonata. CALVERT, Aldabra, Glorioso and Seychelle Is. (178).

Orthoptera. FINOT (391).

6. TROPICAL and EASTERN ASIA, with JAPAN.

For outskirts see also 3 (a.), (g.), (h.). ARABIA, see 3 (h).

Insecta. MATSUMURA, Japan (834).

Coleoptera. Liou-Kiou Islands, see *Insular.*—BLANDFORD (102).—BOILEAU, India (109, 111).—BORN, China (131).—BOURGEOIS, Malacca (132).—BRENSKE (141).—BRENSKE, Japan and China (140).—BRENSKE, India (142).—FAIRMAIRE (359).—FAIRMAIRE, Ishigaki, S. Japan (360).—FAUST, India (374).—FLEUTIAUX, Burma (395).—FLEUTIAUX, Siam (397).—FLEUTIAUX (398).—GESTRO (455).—GESTRO, India (451).—GROUVELLE, India (509).—HELLER, Penang (532).—HORN, Assam (553).—HORN, India, Ceylon (555).—HORN, Malacca (556).—JACOBY, India (602).—JACOBY, Perak (603).—JAKOWLEW, China and Mongolia (607).—JORDAN, Malacca (625).—JORDAN, China (626).—KERREMANS, Japan, Mantchuria (646).—KERREMANS, China (646).—KRAATZ, India (711, 713, 721).—LESNE, incl.

Formosa (769).—LESNE, Malacca (770).—LESNE, Tenasserim (774).—LEWIS, China (778).—MAINDRON, India (808).—OHAUS (901, 902).—PIC, India (964).—PLANET (975).—RAFFRAY (990).—RAFFRAY, India (992).—REITTER, Bucharra (1003, 1014).—RITSEMA, India (1031).—RITSEMA, Assam and Bootang (1035).—ROESCHKE, Korea (1039).—SCHOCH, Assam (1079).—SCHULTZE, Japan (1087).—SCHWARZ, Assam (1092).—SEMENOW, Chinese Turkestan (1117).—SENN, Penang (1121).—TSCHITSCHÉRINE (1237).—TSCHITSCHÉRINE, Siam (1232).—TSCHITSCHÉRINE, North India, Bukhara, Persia, &c. (1233).—TSCHITSCHÉRINE, Japan, China, India, &c. (1234).—TSCHITSCHÉRINE, Korea (1235).—TSCHITSCHÉRINE, India (1240A).—WASMANN, India (1292).—WEISE (1314).—WEISE, Assam (1315).

Hymenoptera. ANDRÉ (16).—BINGHAM, India (96).—BUYSSON (167).—BUYSSON, China (171).—CAMERON (180).—FRIESE, China, Japan (415).—HOWARD, Japan (577).—KOKOUYEW (688).—KONOW (698, 701, 706).—MARLATT, Japan (820).

Lepidoptera. AUSTAUT, N. Tibet (33).—BUTLER, India (159).—BUTLER, Malacca (162).—DRUCE, Burma (313).—DUDGEON, India (320).—FRUHSTORFER, Siam (430).—HAMPSON (517).—HAMPSON, incl. Japan (518).—HAMPSON, India (519).—LATHY, Siam (750).—LEECH (761).—LEECH, China, Japan, Corea (760).—MACKINNON & DE NICÉVILLE, Mussoorie (805).—MOORE (874).—NICÉVILLE, China, E. India (885).—NICÉVILLE (887).—NICÉVILLE, India (886).—POUJADE, India (980).—ROTHSCHILD, Formosa, India (1047).—SNELLEN, Assam (1161).—WARREN (1287, 1288).

Diptera. COQUILLET, Japan (264).—WULP, India (1328).

Hemiptera. KIRKALDY (673).—MATSUMURA, Japan (833).—MELICHAR, China, Japan, India, etc. (844, 845).

Coccidæ. COCKERELL, Japan (227).—COCKERELL, Japan and China (228).—COOLEY (263).—MASKELL, Japan, China, India (829).

Odonata. CALVERT, Kashmir (178).—KRÜGER, Malay penins. (732).

Orthoptera. BOLIVAR (117).—BRUNNER (146).—BURR, Japan and Korea, p. 29, Ent. Mag. 1898.—SCUDDER, Japan (1097).

Aptera. FOLSOM, Japan (400).

7. ASIATIC ARCHIPELAGO, including PAPUA.

Insecta. RAINBOW, New Guinea, P. Linn. Soc. N. S. Wales, xxiii, pp. 363–368.—WEBSTER, N. Guinea (1311).

Coleoptera. BOILEAU, Borneo (112).—BOLIVAR, Borneo and New Guinea (120).—BRENSKE (141, 142).—CANDÈZE (181).—FAIRMAIRE (359).—FAUST (375, 376).—FLEUTIAUX, New Guinea (394, 397); Nias (395).—FRUHSTORFER, Sumatra (427, 433).—GESTRO (454, 455); Celebes (452); New Guinea (450).—GROUVELLE, Java, Celebes (511).—HELLER (532).—HORN, Borneo (555); Philippines (556).—JACOBY (603); Nias (601).—JORDAN (625).—KERREMANS (646).—KRAATZ, Java (717); Java, Borneo (718); Borneo (720); Philippines (722); New Guinea (714).—LESNE, Philippines (769); Borneo and Sumatra (770); New Guinea (774).—LEWIS, Java (778).—MÖLLENKAMP (864).—OHAUS (902).—RAFFRAY, Sumatra (990).—RITSEMA (1032); Java, Buru (1033); Sumatra (1034, 1036); Sumatra, Sumbawa (1031).—SCHENCKLING, Sumatra, Ceram (1069).—SCHOCH (1077); Java (1079).—SCHWARZ, Borneo (1092); Java (1095).—SENN (1121); Java (1120); Mentawai (1123); Nias (1124).—SPAETH, Borneo (1167).—TSCHITSCHÉRINE (1234).—WASMANN, Celebes (1292).—WEISE (1315).—WEYERS, Sumatra (1319).—ZEHTNER, Java (1340).

Hymenoptera. BUYSSON, Ternate (167).—CAMERON (180).—FRIESE (418).—KOHL (686).—KONOW (706); Borneo (701).—ZEHTNER, Java (1339).

Lepidoptera. BUTLER (157, 162); Bali Island (158); Lombok (159).—DRUCE (313, 314).—FRUHSTORFER (428, 431); (426, incl. list of Bali *Rhopalocera*, p. 344).—FRUHSTORFER, Sula (429).—GROSE-SMITH (500);

New Guinea (498).—HAMPSON (517, 518).—HAGEN, Mentawai Islands (515).—MOORE (874).—NICÉVILLE (886); Buru (889).—NICÉVILLE & ELWES (888).—NICÉVILLE & KÜHN, Ké Isles (890).—PAGENSTECHER (924, 925).—New Guinea, REBEL (998).—ROTHSCHILD, New Guinea (1044); Obi (1046).—SEMPER (1118).—SNELLEN (1160, 1162).—WARREN (1287, 1288); Key Islands (1289).

Diptera. KERTÉSZ, New Guinea (653, 654).—WULP (1328); Java (1329); New Guinea (1331).

Hemiptera. BREDDIN (138).—KIRKALDY, Java and Celebes (672); Philippines (675).—MELICHAR (844, 845).—MONTANDON, N. Guinea (868).—SPEISER, Nias Island (1169).

Coccidæ. ZEHNTNER, Java (1336, 1337).

Odonata. FÖRSTER, New Guinea (406).—KRÜGER (732, 733).—MARTIN (827).—McLACHLAN, Borneo (838); Lombok, p. 272, Ent. Mag. 1898.—SELYS, Mentawai Island (1108).

Orthoptera. BOLIVAR (117).—BRUNNER (146).—GRIFFINI, Java (488).—SAUSSURE, Java (1061).

Collembola. SCHÄFFER (1063).

8. AUSTRALIA AND TASMANIA.

The distribution of *Carabidæ* in Australia, SLOANE (1146).

Coleoptera. BLACKBURN (98, 99, 100); GESTRO (455); JACOBY (603); KERREMANS (646); LEA (753); OHAUS (902); RAFFRAY (990); SCHENKLING (1068, 1069); SCHOCH (1078); SLOANE (1146); SPAETH (1167); TSCHITSCHÉRINE (1234); WATERHOUSE (1306); WEISE (1315).

Hymenoptera. ANDRÉ (15, 16); BUYSSON (167); FRIESE (418); HOWARD (577); KIRBY (667).

Lepidoptera. BUTLER (160); GROSE-SMITH (498); HAMPSON (518); LOWER (797); LUCAS (799); NICÉVILLE (886); TURNER (1244, 1245); WARREN (1287, 1288).—Catalogue of Victorian Heterocera, Part xxvii, Conclusion, LOWER, pp. 129–135, Victorian Natural. 1898.—LYELL, *Atella phalanta*, Victorian Natural. xv.—List of butterflies of the Brisbane district, ILLIDGE, pp. 89–102, P. Soc. Queensland, xiii.

Hemiptera. GODING (473); KIRKALDY (676); MASKELL (830); MELICHAR (844, 845); MONTANDON (868, 872).

Coccidæ. FROGGATT (421); MASKELL (829).

Neuroptera. FROGGATT (420).

Orthoptera. BOLIVAR (117).

9. NORTH AMERICA.

Lower California, see Centr. America.

Insecta. COCKERELL (217).—COCKERELL, New Mexico (257).—GODMAN & SALVIN (474).—New York City forty years ago, MARTIN, p. 200, J. N. York ent. Soc. vi.—Localities on Pacific Coast, MORSE (876).—Additional list of Insects taken in Alpine region of Mt. Washington, SLOSSON, pp. 251–253, Ent. News Philad. 1898.—Ohio, WEBSTER, pp. 78–81, Canad. Ent. xxx.—Hamilton, JOHNSTON, pp. 69–72, Canad. Ent. xxx.

Coleoptera. CASEY (189, 190); COCKERELL (258); FALL (371, 372); LEWIS (778); LINELL (787); WICKHAM (1323, 1324, 1326); Canada (1325).—FALL, p. 267, Canad. Ent. xxx.—Northern N. America, WICKHAM, pp. 276–280 of Russell's Explorations in the Far North, Iowa 1898.—Montreal, *Longicornia*, Natural. Canad. xxv, p. 126.—Colorado desert, WICKHAM, pp. 195, and 235–238, Ent. News Philad. 1898.—Lower Rio Grande Valley, WICKHAM, pp. 22–24, 39–41, 81–84, Ent. News Philad. 1898.

Hymenoptera. ASHMEAD (25-29).—COCKERELL (238-247 and 249-254); Pribilof islands (217).—DUNNING (322, 323, 324).—DYAR (336, 338).—FOX (407, 408).—HOWARD (567, 568, 577).—KONOW (700, 702).—MARLATT (821).—ROBERTSON (1038).

Lepidoptera. BEUTENMÜLLER (86, 87).—BUTLER, Bahamas (160).—DYAR (329, 333, 337).—ELWES (345).—FERNALD (389).—FRENCH (411).—HAMPSON (518).—*Pamphila omaha*, *Zeuzera canadensis* to be deleted, HOLLAND (548).—HULST (582).—OTTOLENGUI (916, 917).—SKINNER, Catalogue of *Rhopalocera* (1142).—SMITH (1150, 1151, 1153).—SMITH & DYAR (1156).—STEDMAN (1179).—STRECKER (1194).—WALSINGHAM (1278).—SCHAUS, *Rhopalocera*, p. 96, Ent. News Philad. 1898.—Ontario, MOFFAT, p. 140, Canad. Ent. xxx.—Ontario, GRANT, p. 264, Canad. Ent. xxx.—Brandon, HANHAM, p. 188, Canad. Ent. xxx.—Some Alberta butterflies, DOD, pp. 298-300, Canad. Ent. xxx.—Winnipeg, HANHAM, pp. 33 etc. Canad. Ent. xxx.—Toronto, *Noctuidæ*, GIBSON, pp. 47-51, Rep. Ent. Soc. Ontario, xxix.—Wyoming and Montana, SNYDER, pp. 18-21, Ent. News Philad. 1898.—New Hampshire, FISKE, p. 42, Ent. News Philad. 1898.—Missouri, HALL, p. 143, Ent. News Philad. 1898.—Missouri, *Sphingidæ*, ROWLEY, pp. 189-191, Ent. News Philad. 1898.—Arizona, KUNZE, pp. 57, 112, 113, Ent. News Philad. 1898.

Diptera. ALDRICH (10); COQUILLETT (267-274); DOANE (306); HOUGH (565, 566); HUNTER (584); JOHNSON (619); STEIN (1182); TOWNSEND (1218-1220); WHEELER (1322).—New Mexico, *Mydaidæ*, COCKERELL, p. 448, Amer. Natural. xxxii.—Mesilla Valley, TOWNSEND, p. 291, Psyche, viii.

Aphaniptera. BAKER (47).

Hemiptera. BAKER (40-46); BERGROTH (72); COCKERELL (219); DUZEE (326); GILLETTE (470); HANDLIRSCH (525); KIRKLAND (677); OSBORN & BALL (913); PERGANDE (933); UHLER (1251-1256).

Coccidæ. BOGUE (108); COCKERELL (222-230, 234); COCKERELL & KING (259); COOLEY (263); EHRHORN (242, 243); HUBBARD & PERGANDE (579); JOHNSON (623); KING & TINSLEY (666); PERGANDE (934); TINSLEY (1214-1217).

Neuroptera. BANKS (50); CURRIE (281); HARVEY (529); WILLIAMSON (1327).—Maine, WADSWORTH, p. 111, Ent. News Philad. 1898.—DAVIS, preliminary list of the dragonflies of Staten island, with notes and dates of capture, J. N. York ent. Soc. vi, pp. 195-198.—Iowa, ELROD & CALVERT, pp. 7-10, Ent. News Philad. 1898.

Orthoptera. BLATCHLEY (103); BLATCHLEY, Indiana (104); HANCOCK (523); MORSE (877); SCUDDER (1097-1101); WALKER (1276); WALKER, Canada (1277).—SCUDDER, p. 180, Psyche, viii, and MORSE, *l.c.*—Imported *Orthopteron* in Minnesota, SCUDDER, p. 191, Psyche, viii.—Ontario *Acriidæ*, WALKER, pp. 122-126, Canad. Ent. xxx.

Collembola. HARVEY (530).

10. CENTRAL AMERICA (MEXICO to PANAMA incl.).

Insecta. GODMAN & SALVIN (474).

Coleoptera. GROUVELLE (508), LESNE (769), LEWIS (778), OHAUS (901), PIC (966), RAFFRAY (990, 991), ROSENBERG (1041), SCHENKLING (1069), SCHOCH (1078), SCHWARZ (1092), SPAETH (1166).

Hymenoptera. ANDRÉ (16, 18), BUYSSON (167, 171), FRIESE (414, 416), HOWARD (577), KONOW (700), KRIECHBAUMER (726, 727), MOCSÁRY (863).

Lepidoptera. DRUCE (313, 315, 316), DYAR (331, 332), GODMAN & SALVIN (475), HAMPSON (517, 518), SCHAUS (1064, 1065, 1067).

Hemiptera. BAKER (41, 45, 46), BERGROTH (70, 72, 75), CHAMPION, Lower California (198), COCKERELL (218), DISTANT (302), GILLETTE (470),

KIRKALDY (672), MARTIN (825), MONTANDON (867, 871), OSBORN & BALL (913), UHLER (1254).

Coccidæ. COCKERELL (221, 222, 234), TOWNSEND & COCKERELL (1221).

Neuroptera. BANKS (50), CALVERT (179).

Orthoptera. SCUDDER (1097, 1098).

Aptera. FOLSOM (399).

11. ANTILLES.

Insecta. COCKERELL (260), GODMAN & SALVIN (474).

Coleoptera. CASEY (190), CHAMPION (197), GORHAM (477, 478), GROUVELLE (508, 510), LESNE (769), OLIVIER (904).

Hymenoptera. ANDRÉ (16), BUYSSON (167).

Lepidoptera. COCKERELL, p. 288, Psyche, viii.—HAMPSON (517, 520), LATHY (748, 749), SCHAUS (1065), SHARPE (1133).

Hemiptera. CARPENTER (185), MELICHAR (844, 845), UHLER (1254).

Coccidæ. COCKERELL & TINSLEY (260).

Orthoptera. SAUSSURE & PICTET (474).

12. SOUTH AMERICA, including TRINIDAD.

Insecta. GODMAN & SALVIN (474).—Dry Tortugas, MAYER, p. 299, Psyche, viii.

Coleoptera. BERG (68); BOILEAU (114); BORN, Chili (129); CALVERT, Chili (175); FLEUTIAUX, Chili (396); GRIFFINI (489); GROUVELLE (508); HORN (552, 555, 556, 557); JACOBY (598); KOLBE (693); KRAATZ (714); LESNE (769); LÉVEILLÉ (777); LEWIS (778); LINELL (788); OHAUS (901, 903); PIC (947, 964, 966); RAFFRAY (990 to 992); ROSENBERG (1041); SCHENKLING (1069); SCHOCH (1078); SEIDLITZ (1107, p. 442); SPAETH (1166, 1167); TSCHITSCHÉRINE (1234); WEISE (1313, 1315).

Hymenoptera. ANDRÉ (16); BUYSSON (167, 171); DOMINIQUE (311); FOX (409, 410); FRIESE (414, 416); KRIECHBAUMER (726, 727); MOCSÁRY (863).

Lepidoptera. BUTLER (160, 161); DOGNIN (309, 310); DRUCE (313, 314, 316); DRUCE, S. Am. and Trinidad (315); DYAR (329, 331, 335); GODMAN & SALVIN (475); GROSE-SMITH (502); HAMPSON (517, 518, 520); RIFFARTH (1028); SCHAUS (1064 to 1067); SNELLEN (1162); STAUDINGER (1177); STICHEL (1186).

Diptera. BRAUER (135).

Aphaniptera. N. C. ROTHSCHILD (1042).

Hemiptera. BAKER (45, 46); BERG (65); BERGROTH (70, 71, 73, 75, 76); BREDDIN (139); CHAMPION (198); GILLETTE (470); HANDLIRSCH (525); IHERING (590); KIRKALDY (673); MARTIN (825); MELICHAR (844, 845); MONTANDON (865, 867, 871, 872).

Coccidæ. COCKERELL (229, 231, 232, 234).

Odonata. CALVERT (179); MARTIN (827).

Orthoptera. GIGLIO-TOS (468); GRIFFINI (490, 493).

Aptera. SILVESTRI (1138).

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Critical review of the fossil Insects of the palæontological Museum, Munich, with thirty photographic plates, MEUNIER (850).

Notes on Insects of the Bavarian Coral Chalk, MEUNIER (851).

Insect-wing in Permo-carboniferous rocks in Australia, MITCHELL, p. 437, P. Linn. Soc. N. S. Wales, xxiii.

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Abderina, n. g. *Melandryidæ*, for *A. helmsii*, n. sp. in Prussian amber, SEIDLITZ, p. 577, Ins. Deutschl. v (2).

Sirex = (*Urocerites*), KONOW, p. 87, Wien. ent. Zeit. xvii.

Hageniatermes zitteli, Bavaria Secondary, MEUNIER, p. 118, Arch. Mus. Teyler. (2) vi, n. sp.

III. SYSTEMATIC.

N.B.—The reference numbers collected under the headings of the various groups refer to "Titles" on pp. 5-72, and are intended to give, in each case, a complete list of all memoirs containing anything of importance in connection with the group.

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Luminescent Insects, DUBOIS (317).

(A.) COLEOPTERA.

Note on the wings, KEMPERS, Tijdschr. Ent. xli, Verslag, p. 31.

The venation of the wings of *Coleoptera*, COMSTOCK & NEEDHAM, Amer. Natural. xxxii, pp. 561-565.

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General work on Netherlands *Col.*, EVERTS (354).

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- Ctenostoma* (*Procephalus*) *dormeri*, Brazil, HORN, p. 196, Deutsche ent. Zeitschr. 1898; *C. Klugi*, p. 28, *brevicorne*, *pilosulum*, p. 29, *gibbifrons*, p. 31, *schmalzi*, *dokhturowi*, p. 32, S. America, HORN (552) : n. spp.
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- Megacephala hauseri*, E. Africa, HORN, p. 107, Notes Leyd. Mus. xx, n. sp.
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- Odontochila sternbergi*, Venezuela, p. 101, *jordani*, Ecuador, p. 102, HORN, Notes Leyden Mus. xx, n. spp.
- Oxychila fleutiauxi*, Brazil, HORN, p. 107, *t. c.*, n. sp.
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CARABIDÆ.

[The following titles relate to *Carabidæ*, viz., BERG (66), BORN (129–131), BURGESS (150), CARRET (187), DODERO (308), FAIRMAIRE (368–370), FLEISCHER (392, 393), GESTRO (453), HAMANN (516), HAURY (531), HELLER (532), JOHNSON & CARPENTER (621), LINELL (786), LOMNICKI (790, 791), MAINDRON (808), MAYET (836), R. OBERTHÜR (899), PÉRINGUEY (936), RAFFRAY (988), REITTER (1002–1005, 1009, 1016), ROESCHKE (1039), SEMENOW (1109, 1112), SLOANE (1146), TSCHITSCHÉRINE (1230–1242), VITURAT & FAUCONNET (1270), VORBRINGER (1273), WATERHOUSE (1306), WICKHAM (1323).]

Rudimentary wings of *Carabus* discussed, LOMNICKI (790).

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Abacetus tschoffeni, p. 423, *afer*, p. 424, *congoensis*, p. 425, *intermedius*, p. 426, *duvivieri*, p. 427, *procax*, p. 429, *nitens*, p. 430, *crinifer*, p. 431, *severini*, p. 433, *xanthopus*, p. 434, *subsimilis*, p. 435, *trivialis*, p. 436, *occidentalis*, p. 437, *divergens*, p. 438, *dubiosus*, *metallescens*, p. 439, *pullus*, *tanganjikæ*, *strenuus*, *distigma*, p. 442, Congo, TSCHITSCHÉRINE, Horæ Soc. Ross. xxxii; *A. fraternus*, Cape Good Hope, TSCHITSCHÉRINE, p. 539, Horæ Soc. Ross. xxxii; *A. consors*, *zanzibaricus*, Zanzibar, TSCHITSCHÉRINE, p. 450, Ann. Soc. ent. Belgique, xlii; *A. emeritus*, *viarius*, *perturbator*, p. 359, *proximus*, *pavoninus*, *diversus*, p. 360, *pilosellus*, *cursor*, p. 361, S. Africa, PÉRINGUEY, Tr. S. African Soc. x; *A. latus*, Guinea, p. 15, *dostojewskii*, E. India, p. 18, *koenigi*, p. 20, *ellipticus*, p. 23, *brancsiki*, p. 25, *ganglbaueri*, p. 26, *kordofanicus*, p. 28, Africa, TSCHITSCHÉRINE, Horæ Soc. ent. Ross. xxxii : n. spp.

Abarys robustulus, Brazil, TSCHITSCHÉRINE, p. 83, Horæ Soc. ent. Ross. xxxii, n. sp.

Abatus, n. g., near *Cyrtomoscelis*, for *A. raffrayi*, n. sp., Cape Colony, PÉRINGUEY, Tr. S. African Soc. x.

Acinopus novorossicus, with var. n. *degener*, Russia, SEMENOW, p. 604,

- Horæ Soc. Ross. xxxii; *A. rotundicollis*, Caucasus, CARRET, p. 54, Bull. Soc. ent. France, 1898 : n. spp.
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- Brachinus enonensis*, *vagus*, *funebri*, p. 320, *tibialis*, *oneili*, p. 321, *solidus*, p. 322, S. Africa, PÉRINGUEY, Tr. S. African Soc. x, n. spp.
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- C. amauryi*, Tiflis, HAURY, p. 97, Naturaliste, 1898; *C. sternbergi*, Gensan, ROESCHKE, p. 121, Ent. Nachr. xxiv; *C. tokatensis*, Asia Minor, ROESCHKE, p. 162, t. c.; *C. syrus*, Syria, ROESCHKE, p. 283, t. c.; *C. (Apostocarabus) fleischeri*, Mongolia, REITTER, p. 110, Wien. ent. Zeit. xvii; *C. (Pachycarabus) katharinæ*, Caucasus, REITTER, p. 360, Deutsche ent. Zeitschr. 1898; *C. (Paraplesius) omphreodes*, Asia Minor, REITTER, p. 337, Deutsche ent. Zeitschr. 1898; *C. (Ophiocarabus) johannis*, Turkestan, REITTER, p. 56, Wien. ent. Zeit. xvii : n. spp.
- Carabi procrustogenici*, table of characters, ROESCHKE, p. 285, Ent. Nachr. xxiv.
- Celioschesis*, n. g., p. 93, near *Metaxys*, for *C. distigma*, Africa, n. sp., p. 97; and *Distrigus bipustulatus*, Br., TSCHITSCHÉRINE, Horæ Soc. ent. Ross. xxxii.
- Cenognus*, n. g. for Australian *Anisodactylus*, SLOANE, p. 460, P. Linn. Soc. N. S. Wales, xxiii.
- Ceroglossus*, eating fruit, BERG (66).
- C. dynastes*, Chili, BORN, p. 656, Verh. Ges. Wien, 1898, n. sp.
- Cerotalis longipes*, p. 449, *brachypleura*, p. 450, W. Australia, SLOANE, P. Linn. Soc. N. S. Wales, xxiii, n. spp.
- Chætodactyla*, the male characters, TSCHITSCHÉRINE, p. 99, Horæ Soc. ent. Ross. xxxii.
- Chlænius kolariensis*, India, MAINDRON, p. 130, Bull. Soc. ent. France, 1898; *C. enonensis*, p. 353, *C. (Epomis) rhodesianus*, *C. epigraphidus*, pl. xi, f. 9, p. 355, S. Africa, PÉRINGUEY, Tr. S. African Soc. x : n. spp.
- Coptolabrus smaragdinus*, variation, BORN, p. 717, Verh. Ges. Wien, 1898; *C. lafossei*, var. n. *donckieri*, BORN, p. 337, t. c.; *C. lafossei*, var. *donckieri*, habitat, p. 717, t. c.
- C. meyerianus*, Amur-land, BORN, p. 334, t. c.; *C. mandarinus*, China, BORN, p. 716, t. c. : n. spp.
- Coptoptera phantasma*, Natal, PÉRINGUEY, p. 327, Tr. S. African Soc. x, n. sp.
- Crepidogaster atratus*, p. 322, *portentosus*, p. 323, S. Africa, PÉRINGUEY, Tr. S. African Soc. x, n. spp.
- Crepidopterus impressifrons*, Madagascar, FAIRMAIRE, p. 391, Ann. Soc. ent. Belgique, xlii, n. sp.
- Cyclosomus madecassus*, Madagascar, FAIRMAIRE, p. 222, Ann. Soc. ent. Belgique, xlii, n. sp.

- Cyclothorax*, referred to *Nomiini*, SLOANE, p. 470, P. Linn. Soc. N. S. Wales, xxiii.
- C. blackburni*, W. Australia, SLOANE, p. 472, *t. c.*, n. sp.
- Cymindoeidea humeralis, marshalli*, S. Africa, PÉRINGUEY, p. 326, Tr. S. African Soc. x, n. spp.
- Cynthidia planodisca*, varr. n., *subvirens, gracilis*, TSCHITSCHÉRINE, p. 85, Horæ Soc. ent. Ross. xxxii.
- Darodilia emarginatus*, W. Australia, SLOANE, P. Linn. Soc. N. S. Wales, xxiii, n. sp.
- Dichirotrichus punicus*, Tunis, BEDEL, p. 150, Cat. rais. Col. N. Afrique, n. sp.
- Distichus smithi*, Santarem, LINELL, p. 254, P. U. S. Mus. xxi, n. sp.
- Drimostoma longicornis*, S. Africa, PÉRINGUEY, p. 363, Tr. S. African Soc. x; *D. punctulatum*, p. 413, *validiusculum*, p. 414, Congo, TSCHITSCHÉRINE, Horæ Soc. Ross. xxxii; *D. semenowi*, Ashanti, p. 1, *crassiusculum*, p. 2, *howa*, p. 4, *humerosum*, p. 5, *affine*, p. 6, *prolongatum*, p. 8, Madagascar, TSCHITSCHÉRINE, *t. c.* : n. spp.
- Dromius cordicollis*, Königsberg, VORBRINGER, p. 286, Ent. Nachr. xxiv; *D. nonfriedi*, Caucasus, REITTER, p. 113, Wien. ent. Zeit. xvii; *D. nanniscus*, S. Africa, PÉRINGUEY, p. 329, Tr. S. African Soc. x : n. spp.
- Drypta mashona, natalia*, S. Africa, PÉRINGUEY, p. 318, Tr. S. African Soc. x, n. spp.
- Dyschirius aeneus*, var., CHAMPION, p. 258, Ent. Mag. 1898.
- D. hauseri, scriptifrons*, p. 249, *rufimanus*, p. 250, Turkestan, FLEISCHER, Wien. ent. Zeit. xvii, n. spp.
- Ega natalensis*, referred to *Pseliphanax*, PÉRINGUEY, p. 317, Tr. S. African Soc. x.
- Epicosmus everetti*, Celebes, HELLER, p. 2, pl. iii, fig. 1, Abh. Mus. Dresden, vii, No. 3, n. sp.
- Eristomus sparsutus*, Asia Minor, REITTER, p. 338, Deutsche ent. Zeitschr. 1898, n. sp.
- Eucamptognathus*, characters of species, TSCHITSCHÉRINE, pp. 616–631, Horæ Soc. ent. Ross. xxxii.
- E. infernalis*, p. 624, *pilipes*, p. 628, *howa*, p. 629, Madagascar, TSCHITSCHÉRINE, *t. c.*; *E. oopterus*, p. 122, *dieganus*, p. 126, *curvicrus*, p. 134, Madagascar, TSCHITSCHÉRINE, *t. c.* : n. spp.
- Euchroa dives*, Brazil, TSCHITSCHÉRINE, p. 64, *t. c.*, n. sp.
- Eudema opulentum*, p. 351, pl. xi, fig. 4, *sexmaculatum*, fig. 5, p. 352, S. Africa, PÉRINGUEY, Tr. S. African Soc. x, n. spp.
- Euproctus texanus*, Rio Grande, WICKHAM, p. 109, Bull. Lab. Iowa, iv, n. sp.
- Euschizomerus oberthurii*, Madagascar, FAIRMAIRE, p. 393, Ann. Soc. ent. Belgique, xlii, n. sp.
- Euthenarus comes*, W. Australia, SLOANE, p. 468, P. Linn. Soc. N. S. Wales, xxiii, n. sp.
- Feronia*, monographic revision of the subgen. *Aphaonus*, SEMENOW, Horæ Soc. ent. Ross. xxxii, pp. 478–503; *F. fallaciosa*, n. n. for *intermedia*, Péring., TSCHITSCHÉRINE, p. 545, *t. c.*
- F. (Amolops, subg. n. p. 107) depilata*, N. India, p. 109, *F. (Argutor) monostigma*, p. 110, *liodactyla*, p. 111, Kiang-Si, *setipes*, p. 112, TSCHITSCHÉRINE, Abeille, xxix; *F. (Chalcochrous) captatrix*, Cape Good Hope, TSCHITSCHÉRINE, p. 143, Horæ Soc. ent. Ross. xxxii; *F. (Chalcochrous) otiosa*, Cape, p. 139, *F. (Ogmopleura, n. subg.)*, p. 140, *inca*, p. 148, *perplexa*, *euphænops*, p. 150, *idiodera*, p. 152, *phænogona*, p. 154, *egens*, p. 156, *languens*, p. 157, *anxia*, p. 159, *tarda*, p. 161, Peru, *inops, sublustris*, p. 162, *hebes*, p. 164, *somnians*, p. 165, Chili, *F. (Phenaulax, subg. n. p. 165) stenomorpha*, Australia, p. 167, *F. (Ophryosternus) delicatula*, Australia, p. 169, *F. (Pterostichus) decepatrix*,

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- Feroniini*, synopsis of S. African genera to replace Péringuey's, TSCHITSCHÉRINE, pp. 528–548, Horæ Soc. ent. Ross. xxxii.
- Goniocarabus intermedius*, varr., MÜLLER, pp. 136, 137, Wien. ent. Zeit. xvii.
- Gnathoxys crassipes*, W. Australia, SLOANE, p. 446, P. Linn. Soc. N. S. Wales, xxiii, n. sp.
- Graphipterus distinctus*, p. 340, *curtus*, *darlingi*, p. 341, S. Africa, PÉRINGUEY, Tr. S. African Soc. x, n. spp.
- Haplotrachelus meracus*, S. Africa, PÉRINGUEY, p. 345, *t. c.*, n. sp.
- Harpalobrachys*, n. g., for *Harpalus leiroides* Motsch., SEMENOW, p. 601, Horæ Soc. Ross. xxxii.
- Harpalus aeneus*, *distinguendus* and allies, characters, TSCHITSCHÉRINE, pp. 241–247, Wien. ent. Zeit. xvii; *H. æquicollis*, *optabilis*, p. 95, *maurus*, p. 97, characters, synonymy, TSCHITSCHÉRINE, Abeille, xxix.
- H. tristis*, p. 186, *trivialis*, *anatolicus*, p. 187, Asia Minor, *brachypterus*, Syria, p. 188, TSCHITSCHÉRINE, Ann. Soc. ent. France, lxvii; *H. diligens*, p. 175, *strenuus*, p. 176, Buchara, *famelicus*, Turkestan, p. 177, *alajensis*, Alaj mts. p. 178, *arcuatus*, Buchara, *ingenuus*, Turkestan, p. 179, *sublævigatus*, p. 180, *transcaspicus*, p. 181, Transcaspian, *ussuriensis*, Siberia, p. 182, *nanulus*, Mongolia, p. 183, TSCHITSCHÉRINE, *t. c.*; *H. lobipes*, Korea, TSCHITSCHÉRINE, p. 323, Horæ Soc. Ross. xxxii; *H. bucharicus*, Buchara, p. 94, *schouberti*, Daghestan, p. 96, TSCHITSCHÉRINE, Abeille, xxix : n. spp.
- Heterochira brancsiki*, Madagascar, TSCHITSCHÉRINE, Horæ Soc. ent. Ross. xxxii, p. 101, n. sp.
- Hexatrachus*, subg. n., cf. *Anisodactylus*.
- Holconotus africanus*, *sinuatus*, Africa, p. 452, *lioderus*, *crassimargo*, Siam, p. 453, TSCHITSCHÉRINE, Ann. Soc. ent. Belgique, xlii, n. spp.
- Homoths vicinus*, W. Australia, SLOANE, P. Linn. Soc. N. S. Wales, xxiii, n. sp.
- Hormacrus*, n. g., *Licinini*, p. 488, for *H. latus*, n. sp., W. Australia, p. 489, SLOANE, P. Linn. Soc. N. S. Wales, xxiii.
- Hypolithus strenuus*, *patruelis*, p. 347, *ovampoanus*, *audens*, p. 348, S. Africa, PÉRINGUEY, Tr. S. African Soc. x, n. spp.
- Hystrihopus altitudinis*, S. Africa, PÉRINGUEY, p. 326, *t. c.*, n. sp.
- Klepsiphrus crenatostratus*, Natal, PÉRINGUEY, p. 328, Tr. S. African Soc. x, n. sp.
- Kleptromimus*, n. g., p. 327, near *Klepterus*, for *K. ornatus*, n. sp., Natal, p. 328, PÉRINGUEY, *t. c.*
- Lebia viridana*, Samarkand, *lucilla*, Mardin, REITTER, p. 224, Ent. Nachr. xxiv; *L. fortuita*, p. 331, *congruens*, p. 332, *vaciva*, *natalis*, p. 333, *sperabilis*, *discrepans*, p. 334, *minima*, p. 335, S. Africa, PÉRINGUEY, Tr. S. African Soc. x : n. spp.
- Lebiini*; table of Australian genera, SLOANE, pp. 493, 494, P. Linn. Soc. N. S. Wales, xxiii.

- Lebistinida*, n. g., p. 337, near *Lebistina*, for *L. pulchra*, n. sp., Natal, p. 338, PÉRINGUEY, Tr. S. African Soc. x.
- Lecanomerus occidentalis*, W. Australia, SLOANE, p. 464, P. Linn. Soc. N. S. Wales, xxiii, n. sp.
- Leiradira puella*, p. 41, *blandula*, p. 45, Australia, TSCHITSCHÉRINE, Horæ Soc. ent. Ross. xxxii, n. spp.
- Leptoplesius*, subg. n. of *Carabus*, for *L. marquardti*, n. sp., Mongolia, REITTER, p. 109, Wien. ent. Zeit. xvii.
- Lesticus semenowi*, Java, p. 31, *ganglbaueri*, E. India, p. 33, TSCHITSCHÉRINE, Horæ Soc. ent. Ross. xxxii, n. spp.
- Limnastus luigionii*, Italy, DODERO, p. 543, Ann. Mus. Genova, xxxix, n. sp.
- Loxandrus longiformis*, W. Australia, SLOANE, p. 479, P. Linn. Soc. N. S. Wales, xxxiii; *L. idiocentrus*, p. 86, *elaphropus*, p. 88, Brazil, *moritzi*, Venezuela, p. 91, TSCHITSCHÉRINE, Horæ Soc. ent. Ross. xxxii : n. spp.
- Macrochilus viduatus*, Transvaal, PÉRINGUEY, p. 317, Tr. S. African Soc. x, n. sp.
- Melanodes pugnator*, Natal, PÉRINGUEY, p. 358, *t. c.*, n. sp.
- Metabletus? quadrimpressus*, Madagascar, FAIRMAIRE, p. 464, Ann. Soc. ent. Belgique, xlii, n. sp.
- Metaxymorphus debilis*, p. 324, *recticollis*, p. 325, Cape Colony, PÉRINGUEY, Tr. S. African Soc. x, n. spp.
- Microcephalides*, n. subtribe, TSCHITSCHÉRINE, p. 46, Horæ Soc. ent. Ross. xxxii.
- Microcephalus superbus*, p. 49, *festivus*, p. 51, *affinis*, p. 55, *bolivianus*, p. 56, *catharinæ*, p. 57, S. America, *id.*, *t. c.*, n. spp.
- Microferonia cinctipennis*, W. Australia, SLOANE, p. 490, P. Linn. Soc. N. S. Wales, xxiii, n. sp.
- Morphohaptoderus*, n. subg., cf. *Feronia*.
- Neohaptoderus*, n. subg., cf. *Feronia*.
- Neopangus*, n. g., p. 170, for part of *Pangus*, and *N. heterostictus*, p. 171, *subtilis*, p. 172, *breviformis*, p. 173, n. spp., Turkestan, TSCHITSCHÉRINE, Ann. Soc. ent. France, lxvii.
- Nesarpalus* : [recorded last year as established for *Harpalus vividus* Dej. is founded on *Harpalus vividus* Woll. nec Dej.], BEDEL, Cat. rais. Col. N. Afrique, p. 128.
- Nomiini* : tribe defined and extended, SLOANE, p. 470, P. Linn. Soc. N. S. Wales, xxiii.
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- Nototarus chaudoiri*, p. 511, *interstitialis*, p. 512, W. Australia, SLOANE, *t. c.*, n. spp.
- Ogmopleura*, n. subg., cf. *Feronia*.
- Oreoxenus*, subg. n. of *Trichocellus* for *T. mannerheimi* and *oreophilus*, TSCHITSCHÉRINE, p. 447, Horæ Soc. Ross. xxxii.
- Orinocarabus maritimus*, var. n., *tendanus*, BORN, p. 533, Verh. Ges. Wien, 1898.
- Ophonus abdominalis* Motsch., referred to *Dichirotrichus*, TSCHITSCHÉRINE, p. 98, Abeille, xxix; *O. azureus*, var. n., *apterus*, BEDEL, p. 139, Cat. rais. Col. N. Afrique.
- O. glasunovi*, Persia, TSCHITSCHÉRINE, p. 93, Abeille, xxix, n. sp.
- Parachlænius violaceus*, Zambesi, PÉRINGUEY, p. 356, Tr. S. African Soc. x, n. sp.
- Paraderus*, n. subg., cf. *Feronia*.
- Paralebia*, n. g., p. 335, near *Lebia*, for *P. vicaria*, n. sp., Natal, p. 336, PÉRINGUEY, Tr. S. African Soc. x.
- Parapercosia*, subg. n. of *Amara*, q. v.

- Pedimorphus elongatus*, W. Australia, SLOANE, p. 485, P. Linn. Soc. N. S. Wales, xxiii, n. sp.
- Pelophila borealis*, larva, JOHNSON & CARPENTER, Tr. ent. Soc. London, 1898, p. 133.
- Perileptus madecassus*, Madagascar, FAIRMAIRE, p. 436, Ann. Soc. ent. Belgique, xlii, n. sp.
- Phænaulax*, n. subg., cf. *Feronia*.
- Phænotrichus*, subg. n. of *Amara*, for *A. pumilio*, TSCHITSCHÉRINE, p. 107, Abeille, xxix.
- Pheropsophus cardoni*, India, MAINDRON, p. 131, Bull. Soc. ent. France, 1898, n. sp.
- Philophlæus truncatus*, p. 508, *discolorus*, p. 509, W. Australia, SLOANE, P. Linn. Soc. N. S. Wales, xxiii, n. spp.
- Phlæozetus fesus*, p. 330, *pusillus*, p. 331, S. Africa, PÉRINGUEY, Tr. S. African Soc. xi, n. spp.
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- Platynus fraternus*, *lætulus*, p. 366, *fallaciosus*, *velox*, p. 367, S. Africa, PÉRINGUEY, t. c., n. spp.
- Pæcilus argodi*, Armenia, CARRET, p. 52, Bull. Soc. ent. France, 1898, n. sp.
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- Pterostichus glaber*, note on, VORBRINGER, Ent. Nachr. xxiv, p. 52.
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- S. galapagoensis*, Galapagos, LINELL, p. 253, P. U. S. Mus. xxi ; *S. prævius*, p. 343, *ovampoanus*, p. 344, S. Africa, PÉRINGUEY, Tr. S. African Soc. x ; *S. prælongus*, *biangulatus*, *medioxymus*, p. 392, Madagascar, FAIRMAIRE, Ann. Soc. ent. Belgique, xlii : n. spp.
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- S. occultus*, p. 483, *leai*, p. 484, W. Australia, *id.*, t. c., n. spp.
- Stenidia perrieri*, *rudicollis*, Madagascar, FAIRMAIRE, p. 390, Ann. Soc. ent. France, 1898, n. spp.
- Sthenocranion*, n. g., pp. 352 & 540, for *Feronia severini* & *rugipenne*, TSCHITSCHÉRINE, Horæ Soc. Ross. xxxii.
- Stomonaxus borneensis*, Borneo, p. 13, *japonicus*, Japan, *congoensis*, Africa, p. 14, TSCHITSCHÉRINE, Horæ Soc. ent. Ross. xxxii ; *S. severini*, p. 415, *vicinus*, p. 416, *mocquereysi*, p. 417, *aberrans*, p. 418, Congo, TSCHITSCHÉRINE, Horæ Soc. Ross. xxxii : n. spp.
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- Tetraplatypus*, n. n., for *Tachycellus* Gangl. (subg. of *Bradycellus*), TSCHITSCHÉRINE, p. 62, Abeille, xxix. [Overlooked last year.]
- Thenarotes brunnicolor*, W. Australia, SLOANE, p. 466, P. Linn. Soc. N. S. Wales, xxiii, n. sp.
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- Trichocellus*, monographic revision, TSCHITSCHÉRINE, Horæ Soc. Ross. xxxii, pp. 444–477. In the following list of new species those marked "R." are by REITTER, and those marked "B." by BEDEL.
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- Trigonognathides*, n. subtribe, TSCHITSCHÉRINE, p. 66, *t. c.*
- Trigonotoma niasana*, Nias island, p. 35, *puella*, Java, p. 37, TSCHITSCHÉRINE, Horæ Soc. ent. Ross. xxxii, n. spp.
- Tschitscherinea*, n. n., for *Eunema*, Tschitsch. nec Salt., BERG, p. 18, Com. Mus. Buenos Aires, i.
- Umgenia*, n. g., near *Calleida*, for *U. formidulosa*, n. sp., Natal, PÉRINGUEY, p. 324, Tr. S. African Soc. x.
- Xanthophaea elongata*, p. 495, *constricticeps*, p. 496, W. Australia, SLOANE, P. Linn. Soc. N. S. Wales, xxiii, n. spp.
- Zuphium schelkownikowi*, Caucasus, CARRET, p. 55, Bull. Soc. ent. France, 1898; *Z. trimaculatum*, p. 318, *debile*, p. 319, S. Africa, PÉRINGUEY, Tr. S. African Soc. x, n. spp.

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Brychius, the Russian species, SEMENOW, pp. 511–514, Bull. Soc. Moscou, 1897.

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[Cf. DU BOIS-REYMOND (116), BORDAS (127), FAIRMAIRE (370), GOFFI (476), GRIFFINI (489, 492), JAKOWLEW (607), SAINTE-CLAIRE-DEVILLE (1057), SAINT-HILAIRE (1058), SEMENOW (1110).]

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The defensive, or stink-glands, BORDAS (127).

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C. junodi, Delagoa Bay, *id.*, *t. c.* p. 2, n. sp.

Dytiscus herbeti is *Cybister roeselii*, and *D. pisanus* var. *kunstleri* is *D. circumflexus*, GOFFI, Boll. Mus. Torino, xiii, No. 333; *D. disjunctus*, characters, etc., RÉGIMBART, p. 318, a problematic *Dytiscus* from lac Lausanier, p. 319, Bull. Soc. ent. France, 1898.

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- Gastrophæna*, n. g., near *Bolitochara*, p. 110, for *G. aphænogastri*, n. sp., p. 111, Algeria, FAUVEL, Rev. Ent. franc. xvii.
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- Pygostenus rufus*, Cape Town, RAFFRAY, p. 351, Bull. Soc. ent. France, 1898, n. sp.
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Wien. ent. Zeit. xvii; *X. æqualis*, Algeria, FAUVEL, p. 98, Rev. Ent. franc. xvii : n. spp.

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- Euplectodina*, n. g. for *Euplectus hipposideros* Schauf., RAFFRAY, p. 228, *t. c.*
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- F. auriculatus*, S. Africa, *id.* p. 98, *t. c.*; *F. fauveli*, Bolivia, RAFFRAY, p. 287, Bull. Soc. ent. France, 1898 : n. spp.
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- Reichenbachia oneili*, S. Africa, RAFFRAY, p. 413, Tr. S. African Soc. x, n. sp.
- Rhynosepsis pubescens*, Amazons, RAFFRAY, p. 224, Rev. Ent. franc. xvii, n. sp.
- Sagolonus*, n. g. for *Euplectus patronus* Broun, RAFFRAY, p. 265, Rev. Ent. franc. xvii.
- Shingala*, n. g. for *Octomicrus punctipennis* Raffr., RAFFRAY, p. 255, t. c.
- Sampsia*, n. g., *Euplectini* for *S. longipennis*, n. sp., Sumatra, RAFFRAY, p. 254, t. c.
- Stenoplectus*, n. g., *Euplectini* for *S. sternalis*, n. sp., Australia, RAFFRAY, p. 243, t. c.
- Sognorus oneili*, S. Africa, pl. xviii, fig. 26, RAFFRAY, p. 405, Tr. S. African Soc. x, n. sp.
- Symocerus*, subg. n., cf. *Batrisus*.
- Thysdrus*, n. g., p. 344, ? near *Rhynchoclaviger*, for *T. perrieri*, n. sp., Madagascar, p. 345, FAIRMAIRE, Bull. Soc. ent. France, 1898.
- Tomoplectus*, n. g., p. 266, for *T. cordicollis*, n. sp., Mexico, p. 267, RAFFRAY, Rev. Ent. franc. xvii.
- Trimiodina*, n. g. for *Trimium concolor* Sharp, RAFFRAY, p. 231, t. c.
- Trimiodytes brevipennis*, p. 384, *gracilis*, *cephalotes*, pl. xviii, fig. 23, p. 385, S. Africa, RAFFRAY, Tr. S. African Soc. x, n. spp.
- Trimiosella*, n. g. for *Trimiosopsis anguina* Reitt., RAFFRAY, p. 236, Rev. Ent. franc. xvii.
- Trimium lenkoranum*, Lenkoran, REITTER, p. 117, Wien. ent. Zeit. xvii, n. sp.
- Trychioplectus*, n. g. for *T. geminatus*, n. sp., Victoria, RAFFRAY, p. 272, Rev. Ent. franc. xvii.
- Trymalius*, n. g., p. 345, for *T. foveicollis*, n. sp., Madagascar, p. 346, FAIRMAIRE, Bull. Soc. ent. France, 1898.
- Zelandius*, n. g. for *Euplectus obscurus* Broun, RAFFRAY, p. 272, Rev. Ent. franc. xvii.

PAUSSIDÆ.

[Cf. ESCHERICH (350), FAIRMAIRE (364), PÉRINGUEY (937, 940), WASMANN (1293).]

Anatomy, habits, instinct, relation to ants as exemplified by *Paussus turcicus*, ESCHERICH, Zool. Jahrb. Syst. xii, pp. 27-70, pl. ii.

Remarks on recent literature, with list of the species found in ants'-nests, WASMANN, pp. 507-515, Verh. Ges. Wien, 1898.

Paussus dissidens, Natal, PÉRINGUEY, p. 184, Bull. Soc. ent. France, 1898; *P. perrieri*, *frondosicornis*, p. 270, *asperulus*, p. 271, Madagascar, FAIRMAIRE, t. c.; *P. natalis*, p. 376, pl. xi, fig. 14, *vexator*, fig. 11, p. 377, *comptus*, p. 378, S. Africa, PÉRINGUEY, Tr. S. African Soc. xi : n. spp.

SCYDMÆNIDÆ.

[Cf. CROISSANDEAU (276), GANGLBAUER (473), GUILLEBEAU (513), REITTER (1002), SAINTE-CLAIRE-DEVILLE (1057).]

Continuation of monograph of palæarctic *Scydmaenidæ*, CROISSANDEAU (276).

Cephennium moreli, France, REITTER, p. 338, Deutsche ent. Zeitschr. 1898; *C. banaticum*, p. 15, *bosnicum*, *gallicum*, p. 16, *nanulum*, p. 19, Europe, GANGLBAUER, Käf. Mitteleur. iii : n. spp.

- Cyrtoscydmus densipilis*, France, CROISSANDEAU, p. 412, Ann. Soc. ent. France, lxvi, n. sp.
Euconnus kaufmanni, p. 49, *paganettii*, p. 50, *sturanyi*, p. 54, Europe, GANGLBAUER, Käf. Mitteleur. iii : n. spp.
Neuraphes devillei, Alpes maritimes, FAUVEL, p. 90, Abeille, xxix, n. sp.
Scydmaenus, revision of palæarctic, GUILLEBEAU, pp. 225–238, Ann. Soc. ent. France, lxvii.
S. (Cholerus) reitteri, Greece, GUILLEBEAU, p. 236, Ann. Soc. ent. France, 1898, n. sp.
Spaniococcus, subg. n. of *Euconnus*, GANGLBAUER, p. 42, Käf. Mitteleur. iii.

SILPHIDÆ.

- [*Cf.* ESCALERA (349), FABRE (355), GANGLBAUER (443), HAMANN (516), REITTER (1002, 1008), SAINTE-CLAIRE-DEVILLE (1056), UHAGON (1250).]
 Supplement to monograph of *Cholevæ* of Spain, UHAGON (1250).
 The instinct of *Necrophorus*, FABRE (355).
 Sense-organs on the antennæ and palpi of cavernicolous forms, HAMANN, pp. 529–531, Zool. Anz. 1898.
Agaricophagus reitteri, Hungary, GANGLBAUER, p. 229, Käf. Mitteleur. iii, n. sp.
Agathidium sphærum, n. n. for *rotundulum*, Reitt., REITTER, p. 140, Wien. ent. Zeit. xvii; *A. reitteri*, n. n. for *rotundulum*, Reitt., GANGLBAUER, p. 248, Käf. Mitteleur. iii.
A. (Cyphocele) punctatissimum, Irkutsk, *A. turcicum*, Constantinople, *similare*, hab. ?, p. 52, *brevicorne*, *angusticollis*, Irkutsk, p. 53, REITTER, Wien. ent. Zeit. xvii, n. spp.
Anemadus escalerae, Spain, UHAGON, Actas Soc. espan. 1898; *A. karamani*, Dalmatia, GANGLBAUER, p. 139, Käf. Mitteleur. iii : n. spp.
Bathyscia vallarsæ, n. n. for *silvestris*, Halbh., HALBHERR, p. 180, Wien. ent. Zeit. xvii.
B. sharpi, *autumnalis*, p. 37, *bolivari*, p. 38, North Spain, ESCALERA, Actas Soc. espana, 1898; *B. gobanzi*, Island of Meleda, REITTER, p. 339, Deutsche ent. Zeitschr. 1898 : n. spp.
Chionocatops, subg. n. of *Catops* for *C. bugnioni*, GANGLBAUER, pp. 128, & 137, Käf. Mitteleur. iii.
Choleva bosnica, Bosnia, GANGLBAUER, p. 118, *t. c.*, n. sp.
Cyrtoplastus successor, Talysch, *irregularis*, Irkutsk, REITTER, p. 51, Wien. ent. Zeit. xvii, n. spp.
Cytodromus bucheti, Alpes maritimes, SAINTE-CLAIRE-DEVILLE, p. 196, Bull. Soc. ent. France, 1898, n. sp.
Eurycolon, subg. n. for *Colon latum*, GANGLBAUER, p. 145, Käf. Mitteleur. iii.
Oreosphærule, subg. n. of *Liodes*, GANGLBAUER, pp. 209 & 228, *t. c.*

TRICHOPTERYGIDÆ.

- Gressnerium*, subg. n. of *Ptenidium*, GANGLBAUER, pp. 301, 302, Käf. Mitteleur. iii.
Nossidium flachi, Dalmatia, GANGLBAUER, p. 300, *t. c.*, n. sp.
Ptilium schuleri, Austria, GANGLBAUER, p. 309, *t. c.*, n. sp.

SCAPHIDIIDÆ.

- [*Cf.* FAIRMAIRE (368, 369, 370), GANGLBAUER (443).]

- Caryoscapha*, subg. n. of *Scaphosoma*, GANGLBAUER, pp. 343, 344, Käf. Mitteleur. iii.
Scaphidium quadrillum, Madagascar, FAIRMAIRE, p. 394, Ann. Soc. ent. Belgique, xlii ; *S. ruficorne*, Madagascar, p. 465, Ann. Soc. ent. Belgique, xlii : n. spp.
Scaphisoma, table of palæarctic species, REITTER, p. 314, Ent. Nachr. xxiv.
S. læviusculum, E. Siberia, REITTER, *l. c.* ; *S. rufoguttatum*, Madagascar, FAIRMAIRE, p. 223, Ann. Soc. ent. Belgique, xlii ; *S. rufifrons*, *atomarium*, Madagascar, FAIRMAIRE, p. 394, *t. c.* ; *S. acuticauda*, Madagascar, FAIRMAIRE, p. 465, *t. c.* : n. spp.

HISTERIDÆ.

[*Cf.* FAIRMAIRE (365, 370), GANGLBAUER (443), LEWIS (778), REITTER (1005).]

- Abræus cohæres*, Hong Kong, LEWIS, p. 181, Ann. Nat. Hist. (vii) ii, n. sp.
Anaglymma verula, p. 161, *punctipennis*, p. 162, W. Africa, LEWIS, *t. c.*, n. spp.
Apobletes tuberculifrons, Usambara, LEWIS, p. 159, *t. c.*, n. sp.
Carcinops tenuistriata, Texas, LEWIS, p. 172, *t. c.*, n. sp.
Discoscelis amazoniæ, Santarem, LEWIS, p. 176, *t. c.*, n. sp.
Epiechnus perrieri, *saprophagus*, Madagascar, FAIRMAIRE, p. 324, Bull. Soc. ent. France, 1898, n. spp.
Epierus festivus, Santarem, p. 171, *wickhami*, Indiana, p. 172, LEWIS, Ann. Nat. Hist. (vii) ii, n. spp.
Heterius tristriatus, *brunneipennis*, habits, LEWIS, p. 175, *t. c.*
Hister lineimargo, Ordubad, REITTER, p. 118, Wien. ent. Zeit. xvii ;
H. apicalis, Madagascar, FAIRMAIRE, p. 470, Ann. Soc. ent. Belgique, xlii ; *H. tardigradus*, Congo, p. 167, *sedulus*, Usambara, *flohri*, Mexico, p. 168, *sarcinatus*, Arizona, p. 169, *tunicatus*, Colorado, p. 170, LEWIS, Ann. Nat. Hist. (vii) ii : n. spp.
Hololepta malariae, characters, LEWIS, p. 158, *t. c.*
H. paropsis, p. 157, *africanæ*, p. 158, E. Africa, LEWIS, *t. c.*, n. spp.
Homalopygus amnicola, Rio Janeiro, LEWIS, p. 177, *t. c.*, n. sp.
Monoplius pinguis, habits, female, LEWIS, p. 173, *t. c.*
Pachycrærus princeps, p. 162, *octostriatus*, p. 163, *euphorbiæ*, p. 164, *verulamii*, p. 165, Africa, LEWIS, *t. c.*, n. spp.
Pelorurus carinatus, p. 173, *costipennis*, p. 174, S. Africa, LEWIS, *t. c.*, n. spp.
Placodes ebeninus, characters, LEWIS, p. 159, *t. c.*
Platysoma pinnigerum, Java, LEWIS, p. 160, *t. c.*, n. sp.
Saprinus basalis, Madagascar, FAIRMAIRE, p. 323, Bull. Soc. ent. France, 1898 ; *S. beatulus*, Cape Good Hope, LEWIS, p. 179, Ann. Nat. Hist. (vii) ii : n. spp.
Terapus bicarinatus, Santarem, LEWIS, p. 178, *t. c.*, n. sp.
Termitoxenus strigicollis, Para, LEWIS, p. 175, *t. c.*, n. sp.

PHALACRIDÆ.

Apallodes (Reitt. *Nitidulidæ*) referred to *Phalacridæ*, and is perhaps the same as *Litolibrus* Sharp, GROUVELLE, p. 372, Ann. Soc. ent. France, lxvii.

NITIDULIDÆ.

- [*Cf.* FAIRMAIRE (369), GROUVELLE (508, 509, 510), REITTER (1002, 1005).]
- Apallodes* Reitt., cf. *Phalacridæ*.
Oxyra nitida, Amazons, GROUVELLE, p. 359, Ann. Soc. ent. France, lxxvii, n. sp.
Brachypeplus pallidipennis = (*fulgidus*, Reitt. and *Cillæus simplex*, Reitt.), GROUVELLE, pp. 350, 351, Ann. Soc. ent. France, 1898.
B. (Leiopeplus) compressus, Mexico, p. 348, *longipennis*, Brazil, *similis*, Cayenne, p. 349, GROUVELLE, *t. c.*, n. spp.
Brachypterus insularis, Grenada, GROUVELLE, p. 35, Notes Leyden Mus. xx, n. sp.
Camptodes m-rubrum = (*rubripennis* Reitt.), *humeralis* and *vittatus* distinguished, *onustus* Lac. a valid species, p. 365, *vittatus* Er. = (*rubrolineatus*, Reitt., *trilineatus*, characters, = (*multipunctatus*, Reitt.), p. 366, *bisignatus*, var. = *ventralis* Reitt.), p. 368, *sharpi*, n. n. for *biformis* Sharp nec Reitter, p. 369, GROUVELLE, Ann. Soc. ent. France, lxxvii.
Camptodes germaini, Bolivia, *meridionalis*, Paraguay, *pilula*, Colombia, p. 361, *ignotus*, Amazons, *fallax*, Brazil, p. 362, *nigriceps*, Amazons, *cærulescens*, Bolivia, p. 363, *punctatocollis*, *notatocollis*, Amazons, p. 364, *argus*, *cupreus*, Bolivia, p. 366, *larvatus*, *castelnani*, Brazil, p. 367, *dilutoangulus*, *elongatus*, *æneus*, Bolivia, p. 368, GROUVELLE, *t. c.*, n. spp.
Camptomorphus, n. g., near *Camptodes*, for *C. longipes*, n. sp., Brazil, GROUVELLE, p. 369, *t. c.*
Carpophilops, n. g., near *Brachypeplus*, for *C. fryi*, n. sp., Bahia, GROUVELLE, p. 353, *t. c.*
Carpophilus erythrogonus, Bengal, GROUVELLE, p. 110, Ann. Soc. ent. Belgique, xlii, n. sp.
Cillæus sharpi, n. n., for *prolixus* Sharp nec Fairm., GROUVELLE, p. 351, Ann. Soc. ent. France, lxxvii.
C. impressicollis, Mexico, *insularis*, St. Domingo, *id.*, *t. c.*, n. spp.
Colastus hirtus, *fryi*, p. 344, *atramentarius*, *minutus*, p. 345, *bicolor*, *difficilis*, *opacus*, p. 346, *brunneicornis*, *auropilosus*, p. 347, S. America, GROUVELLE, *t. c.*, n. spp.
Conotelus brachyteroides, p. 351, *fryi*, p. 352, Brazil, GROUVELLE, *t. c.*, n. spp.
Cryptarcha camptoides is American not African, GROUVELLE, p. 374, Ann. Soc. ent. France, lxxvii.
C. germaini, p. 374, *placida*, Bolivia, *minuta*, p. 375, *micros*, p. 376, Brazil, GROUVELLE, *t. c.*, n. spp.
Cybocephalus politissimus, East Siberia, REITTER, p. 117, Wien. ent. Zeit. xvii, n. sp.
Cyllodes grouvelli, *scutellaris*, Madagascar, FAIRMAIRE, p. 396, Ann. Soc. ent. Belgique, xlii, n. spp.
Epuræa deubeli, Transylvania, REITTER, p. 340, Deutsche ent. Zeitschr. 1898, n. sp.
Hapalips, n. spp.; cf. *Erotylidæ*.
Meoncerus punctatolineatus, Peru, GROUVELLE, p. 372, Ann. Soc. ent. France, lxxvii, n. sp.
Mystrops fryi, Brazil, *insularis* "Trinité (Antilles)," GROUVELLE, p. 352, *t. c.*, n. spp.
Oxycnemus ruficollis, Brazil, GROUVELLE, p. 374, *t. c.*, n. sp.
Pallodes smithi, Grenada, p. 35, *cyanescens*, St. Vincent, p. 36, GROUVELLE, Notes Leyden Mus. xx; *P. bohemani*, *discoideus*, p. 370, *ruficornis*, *lætus*, p. 371, Amazons, GROUVELLE, Ann. Soc. ent. France, lxxvii: n. spp.

- Pocadiopsis*, n. g., near *Pocadius*, for *P. dentipes*, n. sp., Chili, GROUVELLE, p. 360, *t. c.*
Platychora major, Amazons, GROUVELLE, p. 358, *t. c.*, n. sp.
Psilotus levis, *tenebrosus*, p. 356, *germaini*, *convexus*, p. 357, Bolivia, GROUVELLE, Ann. Soc. ent. France, lxvii, n. spp.
Prometopia bicolor, p. 354, *germaini*, p. 355, Bolivia, GROUVELLE, *t. c.*, n. spp.
Perilopa fryi, Rio Janeiro, GROUVELLE, p. 354, *t. c.*, n. sp.
Platychora squamosa, p. 110, *varia*, p. 111, Congo, GROUVELLE, Ann. Soc. ent. Belgique, xlii, n. spp.
Rhacostoma, n. n., for *Lobostoma* Fairm. nec Gundl., BERG, p. 18, Com. Mus. Buenos Aires, i.
Somatorus (? in error for *Somatoxus*) *acuminatus*, p. 372, *chilensis*, Bolivia, *brasiliensis*, Rio de Janeiro, p. 373, GROUVELLE, Ann. Soc. ent. France, lxvii, n. spp.

TROGOSITIDÆ.

[Cf. LÉVEILLÉ (776, 777), SEMENOW (1111).]

- Alindria ornata*, Congo, LÉVEILLÉ, p. 158, Bull. Soc. ent. France, 1898 ;
A. sericea, p. 363, *bouvieri*, p. 364, *angusta*, p. 365, Madagascar, LÉVEILLÉ, Bull. Soc. ent. France, 1898 : n. spp.
Ostoma (*Zimioma*), species tabulated, SEMENOW, p. 286, Horæ Soc. ent. Ross. xxxii.
O. (*Zimioma*) *jakolewi*, Centr. Russia, SEMENOW, p. 283, *t. c.*, n. sp.
Temnochila davidi, Ecuador, LÉVEILLÉ, p. 366, Bull. Soc. ent. France, 1898, n. sp.
Tenebroides fryi, Brazil, LÉVEILLÉ, p. 367, *t. c.*, n. sp.

COLYDIIDÆ.

[Cf. FAIRMAIRE (369), GROUVELLE (508 to 511).]

- Catolæmus exilis*, Grenada, GROUVELLE, p. 38, Notes Leyden Mus. xx, n. sp.
Corticoides, n. g., p. 395, aberrant *Colydiidæ*, for *C. setulosus*, n. sp., Madagascar, p. 396, FAIRMAIRE, Ann. Soc. ent. Belgique, xlii.
Erotylathris elongatus, p. 436, *sus*, p. 437, Madagascar, FAIRMAIRE, *t. c.*, n. spp.
Labromimus simplex, Congo, GROUVELLE, p. 111, Ann. Soc. ent. Belgique, xlii, n. sp.
Lado germaini, p. 376, *apicalis*, *sulcatus*, p. 377, Bolivia, *chilensis*, Chili, p. 378, GROUVELLE, Ann. Soc. ent. France, lxvii, n. spp.
Lemnis denticulatus, Grenada, GROUVELLE, p. 39, Notes Leyden Mus. xx, n. sp.
Lithophorus, note on the species which are only three in number, GROUVELLE, p. 379, Ann. Soc. ent. France, lxvii.
L. fryi, Ecuador, *id.*, *t. c.* p. 379, n. sp.
Lytopeplus insularis, St. Vincent, GROUVELLE, p. 40, Notes Leyden Mus. xx, n. sp.
Microsicus minimus, Grenada, GROUVELLE, p. 37, Notes Leyden Mus. xx, n. sp.
Neotrichus insularis, Grenada, GROUVELLE, p. 38, *t. c.*, n. sp.
Philothermus montanus, Bolivia, *major*, Chili, GROUVELLE, p. 380, Ann. Soc. ent. France, lxvii, n. spp.
Plagiope tuberculata, Chev. referred to *Neotrichus*, GROUVELLE, p. 39, Notes Leyden Mus. xx.

- Pseudotarphius pasteuri*, Java, p. 89, *fruhstorferi*, Celebes, p. 90, GROUVELLE, *t. c.*, n. spp.
Pycnomerus insularis, Chili, GROUVELLE, p. 380, Ann. Soc. ent. France, lxvii, n. sp.
Rechodes circumcrenatus, Madagascar, FAIRMAIRE, p. 395, Ann. Soc. ent. Belgique, xlii, n. sp.

CUCUJIDÆ, RHYSODIDÆ.

[*Cf.* ESCHERICH (352), GROUVELLE (510), HELLER (532).]

- Structure and systematic position of *Rhysodidæ*, ESCHERICH (352).
Brontes truncatipennis, Celebes, pl. iii, fig. 6, HELLER, p. 20, Abh. Mus. Dresden, vii, No. 3, n. sp.
Clinidium singulare, Celebes, HELLER, p. 3, pl. iii, fig. 9, *t. c.*, n. sp.
Inopeplus insularis, Grenada, GROUVELLE, p. 41, Notes Leyden Mus. xx, n. sp.
Læmophlæus smithi, p. 41, *caseyi*, p. 42, Grenada, GROUVELLE, *t. c.*, n. spp.
Silvanus pullus, n. n., for *S. denticollis* Reitt. 1890, REITTER, pp. 56 and 140, Wien. ent. Zeit. xvii.

CRYPTOPHAGIDÆ.

- Cryptophagus baldensis* and allies, synonymy and characters discussed, REITTER, p. 68, Ent. Nachr. xxiv.
C. (Mnionomus) opacus, Taschkent, *C. (Micrambe) substriatus*, Araxes Valley, REITTER, p. 19, Wien. ent. Zeit. xvii, n. spp.
Cryptophilus frater, Grenada, GROUVELLE, p. 43, Notes Leyden Mus. xx, n. sp.
Leucohimatium langei, var. n. *obscurata*, SEMENOW, p. 84, Bull. Soc. Moscou, 1898.

LATHRIDIIDÆ.

[*Cf.* BELON (62, 63), REITTER (1006), SEMENOW (1111).]

- Supplement to the catalogue, BELON (63).
Corticaria æqualis, *subpilosula*, p. 29, Ordubad, *illæsiiformis*, Taschkent, p. 30, *atricollis*, Irkutsk, *aphictoides*, Mongolia, p. 31, *obscuripes*, Bohemia, p. 32, REITTER, Wien. ent. Zeit. xvii, n. spp.
Holoparamecus (Calypotbium) raffrayi, Cape Town, BELON, p. 440, Ann. Soc. ent. Belgique, xlii, n. sp.
Lathridius micros = (*bergrothi*, Reitt.) PENECKE, p. 252, Wien. ent. Zeit. xvii.
L. jakolewi, p. 280, *quadraticollis*, p. 282, *kokujewi*, p. 283, Centr. Russia, SEMENOW, Horæ Soc. ent. Ross. xxxii, n. spp.
Melanophthalma capicola, S. Africa, BELON, p. 162, Rev. Ent. franc. xvii; *M. (Corticarina) trichonota*, S. Africa, BELON, p. 448, Ann. Soc. ent. Belgique, xlii, n. sp.
Metophthalmus peringueyi, p. 441, *capensis*, p. 442, S. Africa, BELON, *t. c.*, n. spp.

MYCETOPHAGIDÆ.

[*Cf.* FAIRMAIRE (369), GROUVELLE (510), REITTER (1002).]

- Diplocælus (Marginus) similis*, Grenada, GROUVELLE, p. 44, Notes Leyden Mus. xx, n. sp.
Litargus militaris, Madagascar, FAIRMAIRE, p. 437, Ann. Soc. ent. Belgique, xlii, n. sp.

- Triphyllia*, n. g., for *T. kænigi*, n. sp., Caucasus, REITTER, p. 359, Deutsche ent. Zeitschr. 1898.
Triphyllus madagascariensis, Madagascar, FAIRMAIRE, p. 438, Ann. Soc. ent. Belgique, xlii, n. sp.
Tritoma tschitscherini Reitt. = (*tschitscherini* Sem.), REITTER, p. 140, Wien. ent. Zeit. xvii; *T. decempunctata*, var. n. *rossica*, SEMENOW, p. 86, Bull. Soc. Moscou, 1898.

THORICTIDÆ, DERMESTIDÆ, BYRRHIDÆ, GEORYSSIDÆ.

[Cf. CHOBOUT (204), ESCHERICH (353), FAIRMAIRE (368), WASMANN (1294, 1299, 1300).]

- Anthrenodes*, subg. n. of *Anthrenus*, q. v.
Anthrenus (*Anthrenodes*, subg. n.) *umbellatarum*, Algeria, CHOBOUT, p. 76, Rev. Ent. franc. xvii, n. sp.
Dermestes aurichalceus, habits, FREY-GESSNER, p. 133, Mt. Schweiz. ent. Ges. x; *D. lardarius*, hairs of larva, VOGLER, pp. 17–20, Illustr. Zeitschr. Ent. iii.
Georyssus tubericollis, acute-costatus, Madagascar, FAIRMAIRE, p. 224, Ann. Soc. ent. Belgique, xlii, n. spp.
Limnichus vageguttatus, p. 223, *marmoratus, brevior*, p. 224, Madagascar, FAIRMAIRE, t. c., n. spp.
Pedilophorus algiricus, Tlemcen, CHOBOUT, p. 75, Rev. Ent. franc. xvii, n. sp.
Thorictus foreli; habits, relations with its host *Myrmecocystus viaticus*, ESCHERICH, pp. 483–492, Zool. Anz. 1898; WASMANN, t. c. pp. 536–546; an ectoparasite, WASMANN, p. 435, Zool. Anz. 1898; habits and characters, WASMANN (1294).
T. subcastaneus, Algeria, CHOBOUT, p. 74, Rev. Ent. franc. xvii, n. sp.

PARNIDÆ.

[Cf. FAIRMAIRE (368, 370), GROUVELLE (509, 510, 511).]

- Elmidolia biapicata, umbrina*, p. 466, *minor*, p. 467, Madagascar, FAIRMAIRE, Ann. Soc. ent. Belgique, xlii, n. spp.
Elmis rubripes, Madagascar, FAIRMAIRE, p. 225, t. c., n. sp.
Helmis smithi, Grenada, GROUVELLE, p. 47, Notes Leyden Mus. xx, n. sp.
Limnius ikopæ, Madagascar, FAIRMAIRE, p. 225, Ann. Soc. ent. Belgique, xlii; *L. atomarius*, Madagascar, FAIRMAIRE, p. 467, t. c., n. sp.
Lobelmis cucullatus, Madagascar, FAIRMAIRE, p. 467, t. c., n. sp.
Pachyelmis, n. g., p. 467, for *P. validipes*, n. sp., Madagascar, p. 468, FAIRMAIRE, t. c.
Parnus sulcatulus, Madagascar, FAIRMAIRE, p. 397, t. c.; *P. raffrayi, militaris*, Madagascar, FAIRMAIRE, p. 438, t. c.: n. spp.
Phanocerus congener, Grenada, GROUVELLE, p. 46, Notes Leyden Mus. xx, n. sp.
Potamophilinus notabilis, Congo, GROUVELLE, p. 112, Ann. Soc. ent. Belgique, xlii, n. sp.
Psephenops, n. g., p. 44, for *P. smithi*, n. sp., Grenada, p. 45, GROUVELLE, Notes Leyden Mus. xx.
Sostea pilula, Java, GROUVELLE, p. 91, t. c., n. sp.
Xenanchorinus, n. g., near *Xenanchorus*, p. 45, for *X. latus*, n. sp., Grenada, p. 46, GROUVELLE, Notes Leyden Mus. xx.

PASSALIDÆ.

[Cf. HELLER (532), KUWERT (741).]

Kuwert's tabulation of the *Passalidæ* is concluded (741). We give below several generic names that do not appear to have been previously recorded.

Aponelides, n. g., KUWERT, p. 149, Nov. Zool. v.

Aulacocyclus celebesiensis, Celebes, HELLER, p. 22, Abh. Mus. Dresden, vii, No. 3, n. sp.

Calidas, n. g., KUWERT, p. 278, Nov. Zool. v.

Cyphoproculus, n. g., KUWERT, *t. c.* p. 178.

Epeus, n. g. for *palinii*, Perch., KUWERT, p. 311, *t. c.*

Flavius, n. g., KUWERT, p. 277, *t. c.*

Hyperplesthenus, n. g., KUWERT, p. 318, *t. c.*

Lophocephalus, n. g., KUWERT, *t. c.* p. 145.

Macrolinus urus, Celebes, HELLER, p. 23, Abh. Mus. Dresden, vii, No. 3, n. sp.

Microthorax, n. g., KUWERT, p. 153, Nov. Zool. v.

Morosophus, n. g., KUWERT, p. 154, *t. c.*

Omegarius, n. g., KUWERT, p. 313, *t. c.*

Oeneus, n. g., KUWERT, p. 259, *t. c.*

Parapertinax, n. g., KUWERT, p. 154, *t. c.*

Paxillosomus, n. g., KUWERT, p. 181, *t. c.*

Pelopides, n. g., KUWERT, p. 322, *t. c.*

Phanocles, n. g., KUWERT, p. 204, *t. c.*

Phraortes, n. g., KUWERT, p. 325, *t. c.*

Polyacanthopus, n. g., KUWERT, p. 189, *t. c.*

Ptychotrichus, n. g., KUWERT, p. 276, *t. c.*

Severus, n. g., KUWERT, p. 161, *t. c.*

Synesius, n. g., KUWERT, p. 199, *t. c.*

Tatius, n. g., KUWERT, p. 315, *t. c.*

Thryptocerus, n. g., KUWERT, p. 200, *t. c.*

Toxeutotaenius, n. g., KUWERT, p. 195, *t. c.*

Trichopleurus, n. g., KUWERT, p. 143, Nov. Zool. v.

LUCANIDÆ.

[Cf. BOILEAU (109–115), FELSCH (384), FRUHSTORFER (427–433), HELLER (532), MÖLLENKAMP (864), PLANET (975), RITSEMA (1036).]

Catalogue of the described *Lucanidæ*, FELSCH (384).

For a large number of additions of localities, references, etc., and for various corrigenda to Felsch's Catalogue, cf. BOILEAU, pp. 401–432, Ann. Soc. ent. France, lxxvii.

Allotopus rosenbergii, pupa, RITSEMA, p. 162, pl. i, Notes Leyden Mus. xx.

Calodæmon, n. g. for *C. multicolor*, n. sp., Bolivia, BOILEAU, p. 119, Naturaliste, 1898.

Cyclommatus modiglianii, p. 620, *elaphus* or *gestroi*, p. 622, Sumatra, RITSEMA, Ann. Mus. Genova, xxxix; *C. speciosus*, Borneo, *consanguineus*, Bougainville, BOILEAU, p. 268, Bull. Soc. ent. France, 1898 : n. spp.

Eurytrachelus costatus, Liou-Kiou Islands, BOILEAU, p. 45, Naturaliste, 1898; *E. egregius*, New Guinea, MÖLLENKAMP, p. 146, Soc. ent. xii : n. spp.

Figulus procerus, Celebes, HELLER, p. 21, Abh. Mus. Dresden, vii, No. 3, n. sp.

Lucanus, monograph, PLANET (975); *L. maculifemoratus* var. *elegans*, p. 19, cut, PLANET, Naturaliste, 1898.

- L. ferriei*, Liou-Kiou Islands, p. 251, *thibetanus*, Tibet, p. 277, PLANET, Naturaliste, 1898, n. spp.
Hemisodorcus donckieri, Himalaya, BOILEAU, p. 227, cut, Bull. Soc. ent. France, 1898, n. sp.
Hexarthrius castetsi, India, BOILEAU, p. 581, Ann. Soc. ent. France, lxvi, n. sp.
Odontolabis mollenkampii, Sumatra, FRUHSTORFER, p. 167, Berlin. ent. Zeitschr. xliii; *O. sarasinorum*, Celebes, pl. iii, fig. 11, HELLER, p. 21, Abh. Mus. Dresden, vii, No. 3 : n. spp.
Prosopocelus neervoorti, Sumbawa, FRUHSTORFER, p. 36, Ent. Nachr. xxiv, n. sp.
Psolidoremus dissimilis, Liou-Kiou Islands, BOILEAU, p. 95, Bull. Soc. ent. France, 1898, n. sp.
Xenostomus, n. g., near *Ægus*, p. 264, for *X. ritsemæ*, n. sp., Borneo, p. 265, BOILEAU, Bull. Soc. ent. France, 1898.

SCARABÆIDÆ.

[The following titles relate to *Scarabæidæ*, viz.: ABEILLE (2), ALLUAUD (13), BLACKBURN (98), BRENSKE (140–143), CHAMPENOIS (194), CLOUET (215), DESBROCHERS (295), FAIRMAIRE (359, 362, 367, 368, 369, 370), FÉRÉ (385), GESTRO (455), HELLER (532), JORDAN (626), LINELL (788), MÜLLER (882), OHAUS (901, 902, 903), D'ORBIGNY (905–908), PIC (951), REITTER (1002, 1003, 1005), RITSEMA (1031), SEMENOW (1112, 1113, 1116), VAULOGER (1262). See also *Cetoniini*, p. 130.]

Coprini.

- Acanthocerini*, revision with new genera, GESTRO (455).
Aphodiides, for numerous synonyms, refer to CLOUET, pp. 187, 188, Bull. Soc. ent. France, 1898.
Aphodius parvulus Har., systematic position, CLOUET, p. 240, Ann. Soc. ent. France, lxvii; *A. puterrius*, *elongatulus*, and *crenatus*, distinguished, CLOUET, p. 239, t. c.; *A. tunicatus*, var. n. *modica*, SEMENOW, p. 89, Bull. Soc. Moscou, 1898.
A. capitulatus, Algeria, CLOUET, p. 186, Bull. Soc. ent. France, 1898; *A. humerideus*, Sivas, *A. (Esinus) filitarsis*, Akbès, REITTER, p. 342, Deutsche ent. Zeitschr. 1898; *A. gresseri*, Centr. Russia, SEMENOW, p. 611, Horæ Soc. Ross. xxxii; *A. kukunorensis*, Amdo, p. 507, *tescorum*, W. Siberia, p. 508, SEMENOW, Bull. Soc. Moscou, 1897; *A. (Volinus) inquinatulus*, Wladimir, REITTER, p. 119, Wien. ent. Zeit. xvii : n. spp.
Bolboceras gallicus, habits, FABRE, pp. 457–460, Arch. Zool. exp. xxvi.
B. vaulogeri, Tunis, ABEILLE, p. 254, Bull. Soc. ent. France, 1898, n. sp.
Caccobius minimus, Arabia, D'ORBIGNY, p. 160, Bull. Soc. ent. France, 1898, n. sp.
Cyphopisthes, n. g., p. 488, for part of *Synarmostes*, with *C. humeralis*, Borneo, p. 489, *georyssoides*, Sumatra, p. 490, n. spp., GESTRO, Ann. Mus. Genova, xxxix.
Epilissus perrieri, *semicribrosus*, Madagascar, FAIRMAIRE, p. 470, Ann. Soc. ent. Belgique, xlii, n. spp.
Euparia nigricans, Westw., referred to *Aphodius*, CLOUET, p. 240, Ann. Soc. ent. France, lxvii.
Eusphæropeltis, n. g., p. 465, for part of *Synarmostes*, with *E. iris*, Mentawai, p. 466, *corruscus*, Borneo, p. 468, *raapii*, Nias, p. 469, *modiglianii*, p. 470, *aureola*, p. 471, Sumatra, n. spp., GESTRO, Ann. Mus. Genova, xxxix.
Gymnoropterus, n. g. for *Synarmostes striatulus* Lansb., GESTRO, p. 474, t. c.
Heptaulacus testudinarius, habits, SOPP, p. 114, Ent. Mag. 1898.

- Lethrus pygmaeus majusculus* subsp. n., SEMENOW, p. 632, Horæ Soc. Ross. xxxii.
- L. korshinskii*, Buchara, p. 635, *dostojewskii*, Transcaspian, p. 638, SEMENOW, t. c., n. spp.
- Oniticellus pallipes*, *pallens*, *concinus*, synonymical note, WATERHOUSE, p. 75, Ann. Nat. Hist. (vii) ii.
- O. sinuaticornis*, *fasciolatus*, p. 398, *neuter*, *rudicollis*, *proerugosus*, p. 399, *viridiflavus*, p. 400, Madagascar, FAIRMAIRE, Ann. Soc. ent. Belgique, xlii; *O. perrieri*, Madagascar, FAIRMAIRE, p. 471, t. c. : n. spp.
- Onthophagus pipitzi* = (*regulus* Brancs.), FAIRMAIRE, p. 398, Ann. Soc. ent. Belgique, xlii; *O. fabricii*, n. n. for *O. vitulus* Fabr., Supp. Ent. syst., d'ORBIGNY, p. 180, Bull. Soc. ent. France, 1898; *O. granulifer*, habitat, REITTER, p. 178, Wien. ent. Zeit. xvii.
- O. bifenestratus*, Armenia, REITTER, p. 342, Deutsche ent. Zeitschr. 1898; *O. oberthuri*, Mesopotamia, p. 161, *margaritifera*, Arabia, p. 162, d'ORBIGNY, Bull. Soc. ent. France, 1898; *O. lemuroides*, p. 177, *millingeni*, p. 178, Mesopotamia, d'ORBIGNY, t. c. : n. spp.
- Orphnus subfoveatus*, Soudan, FAIRMAIRE, p. 211, Notes Leyden Mus. xx, n. sp.
- Perignamptus loriae*, p. 492, *carinipennis*, p. 493, New Guinea, GESTRO, Ann. Mus. Genova, xxxix, n. spp.
- Phæochroops silphoides*, Sumatra, FAIRMAIRE, p. 383, Ann. Soc. ent. France, lxvii, n. sp.
- Psammobius indicus* Har. = (*sculpticollis* Fairm.), CLOUET, Ann. Soc. ent. France, lxvii, p. 240.
- P. chobauti*, Algeria, d'ORBIGNY, p. 148, Bull. Soc. ent. France, 1898, n. sp.
- Pterorthochætes*, n. g. for part of *Synarmostes*, with *P. incertus*, p. 479, Borneo, etc., *brevisetosus*, Singapore, p. 481, *insularis*, Borneo, p. 482, *simplex*, Queensland, p. 484, *cribricollis*, New Guinea, p. 485, *fecæ*, Pegu, p. 486, *hirtus*, Sumatra, p. 487, n. spp., GESTRO, Ann. Mus. Genova, xxxix.
- Sisyphus regnardi*, Mauritius, ALLUAUD, p. 64, Bull. Soc. zool. France, 1898, n. sp.
- Stiptopodius doriae*, note and figure, GESTRO, p. 519, Ann. Mus. Genova, xxxix.
- Synarmostes perrieri*, Madagascar, FAIRMAIRE, p. 471, Ann. Soc. ent. Belgique, xlii, n. sp.
- Trox suberosus*, habits, BERG, p. 29, Com. Mus. Buenos Aires, i.

Glaphyrini.

- Glaphyrus turkestanicus*, *sogdianus*, true females of, CHAMPENOIS, p. 346, Bull. Soc. ent. France, 1898.
- G. superbus*, Transcaspian, p. 247, *equestris*, Egypt, p. 248, CHAMPENOIS, t. c., n. spp.

Melolonthini.

- The divisions of Australian *Melolonthini*, with tabulation of *Sericides* and *Sericoides*, BLACKBURN, pp. 18–63, Tr. Soc. S. Austral. xxii.
- Amorphochelus*, n. g., near *Hoplia* and *Hopliopsis*, for *A. perrieri*, n. sp., Madagascar, FAIRMAIRE, p. 400, Ann. Soc. ent. Belgique, xlii.
- Anacanthopus*, n. g., p. 42, *Sericoides* anomalous, for *A. inermis*, n. sp., Queensland, p. 43, BLACKBURN, Tr. R. Soc. S. Austral. xxii.
- Aneucomides*, n. g., p. 34, anomalous, near *Colpochila*, for *A. coloratus*, n. sp., S. W. Australia, p. 35, BLACKBURN, t. c.
- Apogonia conradtii*, Congo, FAIRMAIRE, p. 212, Notes Leyden Mus. xx;

- A. sulcaticeps*, Sumatra, p. 29, *blanchardi*, India, p. 30, *impressa*, Sumbawa, p. 31, RITSEMA, t. c. : n. spp.
- Autoserica*, n. g., p. 377, with *A. adjuncta*, Persia, p. 381, *caifensis*, Caifa, p. 382, *gibbiventris*, p. 396, *ventralis*, p. 397, *laboriosa*, p. 399, *furcillata*, p. 400, *stridula*, p. 401, *futschauana*, p. 404, *harmonica*, *senta*, p. 405, China, *secreta*, Japan, p. 431, n. spp., BRENSKE, Berlin. ent. Zeitschr. xlii; also *A. hongkongica*, p. 208, *flammea*, p. 209, *formosæ*, p. 210, *davidis*, p. 213, China and Formosa, *hauseri*, p. 240, *naporeana*, p. 241, *cardoni*, p. 242, *severini*, *setosa*, p. 243, *burmeisteri*, p. 244, *subspinosa*, p. 245, *calcuttæ*, *lugubris*, p. 246, *barwayana*, *carinifrons*, p. 247, *carinirostris*, p. 248, *significans*, *spoliata*, p. 249, *bengalensis*, *quinquidens*, p. 250, *maxima*, p. 252, India, *chalybæa*, p. 264, *breviata*, p. 265, *calcarata*, p. 266, *immunita*, p. 267, *cinnaberina*, p. 271, *tranquebarica*, p. 272, *singhalensis*, p. 274, *implicata*, p. 275, *utacamanda*, p. 276, *straba*, p. 277, *fistulosa*, p. 278, *cinerea*, p. 279, S. India and Ceylon, *himalayica*, p. 293, *festina*, p. 296, *fatifera*, *singularis*, p. 298, *comosa*, *modesta*, p. 301, *simlana*, p. 302, *umbilicata*, *umbratica*, p. 303, *alcocki*, *unctiuscula*, p. 304, *truncata*, *sikkimensis*, p. 305, *fumosa*, p. 306, India, *colossica*, Burma, p. 324, *significans*, Assam, p. 326, *signatitarsis*, Pegu, p. 327, *sempiterna*, Khasia hills, p. 328, *spinifera*, p. 329, *sordida*, p. 330, *unguicularis*, *spectabilis*, p. 331, Burma, *manipurana*, *inermis*, p. 332, *assamensis*, N.W. India, *contracta*, p. 333, *sericella*, p. 335, *sontica*, *perniciosa*, p. 336, Burma, *servitrita*, Assam, p. 337, *ruficollis*, p. 338, Burma, *peguana*, p. 339, *palona*, p. 340, Pegu, *satrapa*, p. 341, *teinzoana*, *birmanica*, p. 343, Burma, *staturosa*, Bangkok, p. 358, *tibialis*, Saigon, p. 359, *insubida*, Tonkin, p. 360, *sinuosa*, Tenasserim, p. 362, *sinistra*, Siam, p. 363, *cochin-chinæ*, Saigon, p. 366, *mulmeina*, *varia*, p. 368, *thagatana*, p. 369, Tenasserim, *insularis*, p. 373, *fulgida*, p. 374, *andamana*, p. 375, Andaman islands, *spatiosa*, Pedong, p. 377, *solida*, Singapore, *sincera*, p. 378, *saginata*, Malacca, *absoluta*, Singapore, p. 379, *bismarckiana*, *moebiusi*, p. 384, *inimica*, p. 385, *sincera*, p. 386, *inæqualis*, p. 392, Sumatra, BRENSKE, Berlin. ent. Zeitschr. xliii : n. spp.
- Balbera*, n. g., near *Hymenoplia*, for *B. reflexa*, n. sp., Madagascar, FAIRMAIRE, Ann. Soc. ent. Belgique, xlii, p. 226.
- Brachypholis*, n. g., *Leucopholiniæ*, for *B. rothschildi*, n. sp., Congo, BRENSKE, p. 239, Ent. Zeit. Stettin, lix.
- Brachyserica*, n. g., p. 386, for *Serica arenicola*, etc., BRENSKE, Berlin. ent. Zeitschr. xlii.
- Brenskiella*, n. n. for *Pachychæta* Br. nec Big., BERG, p. 17, Com. Mus. Buenos Aires, i.
- Burmeisteriellus*, n. n. for *Burmeisteria* Sch. nec Gr., BERG, p. 17, Com. Mus. Buenos Aires, i.
- Caulobius punctulatus*, *advena*, p. 51, *discedens*, p. 52, *compactus*, p. 53, *evanescens*, p. 54, Australia, BLACKBURN, Tr. R. Soc. S. Austral. xxii, n. spp.
- Chætosserica*, n. g., for *C. cymosa*, India, n. sp., BRENSKE, p. 313, Berlin. ent. Zeitschr. xliii.
- Chariochilus*, n. g., near *Cyphochilus*, for *C. metallescens*, n. sp., New Guinea, BRENSKE, p. 237, Ent. Zeit. Stettin, lix.
- Cheiragra*, notes, BLACKBURN, p. 27, Tr. R. Soc. S. Austral. xxii.
- Cheirrrhampica*, n. g., near *Phyllotocus*, for *C. pubescens*, W. Australia, p. 25, *interstitialis*, N. Queensland, p. 26, n. spp., BLACKBURN, Tr. R. Soc. S. Austral. xxii.
- Chrysoserica*, n. g., for *C. auricoma*, p. 315, *gigantea*, p. 316, n. spp., India, BRENSKE, Berlin. ent. Zeitschr. xliii.
- Colpochilodes*, n. g., *Sericoides*, for *C. raucipennis*, n. sp., W. Australia, BLACKBURN, p. 44, Tr. R. Soc. S. Austral. xxii.

- Dicheloplia fuscipicta*, Tonkin, FAIRMAIRE, p. 382, Ann. Soc. ent. France, lxvii, n. sp.
- Dysphanochila*, n. g., *Sericoides*, for *D. pilosipennis*, n. sp., W. Australia, BLACKBURN, p. 48, Tr. R. Soc. S. Austral. xxii.
- Empecta nudiplaga*, Madagascar, FAIRMAIRE, p. 227, Ann. Soc. ent. France, xlii, n. sp.
- Enaria sculptipennis*, Madagascar, FAIRMAIRE, p. 227, Ann. Soc. ent. Belgique, xlii, n. sp.
- Engyops*, n. g., p. 43, *Sericoides*, for *E. spectans*, n. sp., Queensland, p. 44, BLACKBURN, Tr. R. Soc. S. Austral. xxii.
- Epholcis*, characters and composition, BLACKBURN, p. 28, t. c.
- E. longior*, Queensland, *id.*, t. c. p. 29, n. sp.
- Frenchella hispida*, p. 39, *approximans*, *hirticollis*, p. 40, *aspericollis*, *sparsiceps*, p. 41, Australia, BLACKBURN, t. c., n. spp.
- Gastroserica*, n. g.?, p. 412, with *G. sulcata*, p. 414, *angustula*, p. 416, China, n. spp., BRENSKE, Berlin. ent. Zeitschr. xlii.
- Glossocheilifer*, n. g., p. 36, *Sericoides*, for *G. labialis*, n. sp., W. Australia, p. 37, BLACKBURN, Tr. R. Soc. S. Austral. xxii.
- Gynacoserica*, n. g., p. 314, for *S. pellecta*, Br., BRENSKE, Berlin. ent. Zeitschr. xliii.
- Haplopsis* and *Heteronyx* distinguished, p. 49, *H. lineoligera*, *pilosa*, *grisea*, synonymy, p. 51, BLACKBURN, Tr. R. Soc. S. Austral. xxii.
- H. debilis*, *olliffi*, Australia, BLACKBURN, p. 50, t. c., n. spp.
- Heptelia*, n. g., near *Pentelia*, for *P. stripidea*, n. sp., Borneo, BRENSKE, p. 247, Ent. Zeit. Stettin, lix.
- Hoplia errata*, n. n. for *fasciculata* Nonfr. nec Bl., FAIRMAIRE, p. 474, Ann. Soc. ent. Belgique, xlii.
- H. (Decamera) bucharica*, Bucharra, REITTER, p. 10, Wien. ent. Zeit. xvii; *H. pygialis*, *latipennis*, p. 472, *martinia*, p. 473, Madagascar, FAIRMAIRE, Ann. Soc. ent. Belgique, xlii : n. spp.
- Lasioserica*, n. g., p. 309, for *L. calva*, *thoracica*, p. 310, *pilosella*, p. 312, India, *insperata*, Khasia hills, p. 357, BRENSKE, Berlin. ent. Zeitschr. xliii, n. spp.
- Mechidius*, discriminatory notes and tabulation of the species, BLACKBURN, pp. 54–59, Tr. R. Soc. S. Austral. xxii.
- M. gibbicollis*, p. 59, *ordensis*, *collaris*, *imitator*, p. 60, *modicus*, *multistriatus*, p. 61, *excisicollis*, *antennalis*, p. 62, Australia, BLACKBURN, t. c., n. spp.
- Maladera imbella*, Turkestan, REITTER, p. 119, Wien. ent. Zeit. xvii, n. sp.
- Melaserica*, n. g.?, with *M. thibetana*, n. sp., Ta-tsien-lu, BRENSKE, p. 421, Berlin. ent. Zeitschr. xlii.
- Melolontha vulgaris* and *hippocastani*, distinctions in habits and natural history, MÜLLER, Zool. Garten, xxxix, pp. 250–255.
- M. alboplagiata*, Sikkim, BRENSKE, p. 236, Ent. Zeit. Stettin, lix, n. sp.
- Mericserica*, n. g., *oberthuri*, India, n. sp., BRENSKE, p. 321, Berlin. ent. Zeitschr. xliii.
- Microserica*, n. g., p. 417, with *M. sigillata*, p. 417, *hiulca*, p. 419, China, *nikkonensis*, Japan, p. 435, n. spp., BRENSKE, Berlin. ent. Zeitschr. xlii; also *M. hainana*, China, p. 216, *quadripunctata*, p. 255, India, *fairmairei*, S. India, p. 212, *darjeelingia*, p. 319, India, *semirufa*, Ladak, p. 320, *globula*, Burma, p. 354, *lineola*, p. 402, *agraria*, p. 404, Sumatra, BRENSKE, Berlin. ent. Zeitschr. xliii, n. spp.
- Monotropus fausti*, n. n. for *nordmanni* Faust nec Blanch., SEMENOW, p. 95, Bull. Soc. Moscou, 1898.
- Neophyllotocus*, n. n. for *Macrothops* MacL. nec Boisd., BLACKBURN, p. 27, Tr. R. Soc. S. Austral. xxii.
- Neoserica*, n. g., p. 410, with *N. silvestris*, n. sp., not described, BRENSKE, Berlin. ent. Zeitschr. xlii; also *N. quadriplabellata*, 4-lamellata, p. 253,

- 5-*flabellata*, p. 254, India, *sericata*, p. 280, *splendifica*, p. 281, *satura*, p. 345, *gestroi*, *saturella*, p. 347, *septemlamellata*, p. 349, *nigra*, *fecæ*, p. 350, *rugosa*, p. 351, *lubrica*, p. 352, Burma, *speciosa*, Assam, p. 353, *inclinata*, Cochin China, p. 371, *apogonoides*, Singapore, p. 380, *penangica*, *sumatrensis*, p. 395, *sharpi*, *soekerandana*, p. 398, *indistincta*, p. 400, *squamifera*, p. 401, *enganoana*, Engano, p. 402, BRENSKE, Berlin. ent. Zeitschr. xliii, n. spp.
- Neso*, n. g., near *Colpochila*, for *N. usta*, p. 45, *yorkensis*, *planicollis*, p. 46, n. spp., Queensland, BLACKBURN, Tr. R. Soc. S. Austral. xxii.
- Nosphisthis*, n. g., p. 38, near *Frenchella*, for *N. parvicornis*, n. spp., N. S. Wales, p. 39, BLACKBURN, Tr. R. Soc. S. Austral. xxii.
- Oxychirus* Qued. referred to *Phænomerides*; cf. *Rutelini*, BRENSKE, p. 185, Soc. Ent. xii.
- Pachyserica*, n. g. with *P. rubrobasalis*, n. sp., China, BRENSKE, p. 420, Berlin. ent. Zeitschr. xlii: also *P. albosquamosa*, Khasia hills, p. 356, BRENSKE, Berlin. ent. Zeitschr. xliii: n. sp.
- Periserica*, n. g. for *P. picta*, n. sp., Ceylon, p. 284, BRENSKE, t. c.
- Petinopus*, n. g., p. 35, near *Colpochila*, for *P. ægrotus*, n. sp., Australia, p. 36, BLACKBURN, Tr. R. Soc. S. Austral. xxii.
- Pholidochris kolbei*, Congo, BRENSKE, p. 241, Ent. Zeit. Stettin, lix, n. sp.
- Phyllotocidium*, n.g., for *Cheiragra macleayi* Blackb., BLACKBURN, p. 24, Tr. R. Soc. S. Austral. xxii.
- Phyllotocus*, table of species, BLACKBURN, pp. 21-24, t. c.
- Pseudopholis jordani*, p. 243, *kuiuensensis*, p. 245, Congo, BRENSKE, Ent. Zeit. Stettin, lix, n. spp.
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- A. bottegoi*, Somaliland, KERREMANS, p. 505, Ann. Mus. Genova, xxxix; *A. taciturnus*, Nias island, KERREMANS, p. 180, Ann. Soc. ent. Belgique, xlii : n. spp.
- Belionata sumptuosa*, var. n. *tricolor*, THÉRY, p. 59, Bull. Soc. ent. France, 1898.
- B. madagascariensis*, Madagascar, THÉRY, p. 58, t. c.; *B. mindorensis* Mindoro, KERREMANS, p. 132, Ann. Soc. ent. Belgique, xlii : n. spp.
- Briseis acuminata*, Queensland, KERREMANS, p. 129, t. c., n. sp.
- Buprestis apicipennis*, Kurdistan, REITTER, p. 344, Deutsche ent. Zeitschr. 1898, n. sp.
- Chrysobothris tschitscherini*, Transcaspian, SEMENOW, p. 652, Horæ Soc. ent. Ross. xxxii; *S. gabonica*, Gaboon, p. 56, *strigicollis*, Abyssinia, *lethierryi*, Zanzibar, p. 57, THÉRY, Bull. Soc. ent. France, 1898; *C. auricollis*, Congo, KERREMANS, p. 305, Ann. Soc. ent. Belgique, xlii; *C. regina*, Queensland, KERREMANS, p. 133, t. c. : n. spp.
- Chrysochroa kerremansi*, Sumatra, WEYERS, p. 456, Ann. Soc. ent. Belgique, xlii, n. sp.
- Cisseis frontalis*, New Guinea, *cuprifrons*, p. 157, *morosa*, *aenea*, p. 158, *aurulenta*, p. 159, *viridicuprea*, *splendida*, p. 160, *fulgidifrons*, *cupri-ventris*, p. 161, *nitidicollis*, *nigroaenea*, p. 162, *cyanura*, *viridis*, p. 163, *nitida*, *ignicollis*, *vicina*, p. 164, *tasmanica*, *viridana*, p. 165, *coreboides*, *cincta*, p. 166, *scabrosula*, *pauperula*, p. 167, *inops*, *nigrita*, *viridiceps*, p. 168, *fairmairei*, *rubicunda*, p. 169, *modesta*, *semiobscura*, *puella*, p. 170, *simplex*, p. 171, Australia, KERREMANS, Ann. Soc. ent. Belgique, xlii, n. spp.
- Cisseoides albopicta*, p. 171, *cyanura*, p. 172, *modesta*, p. 173, Australia, KERREMANS, t. c., n. spp.
- Cylindromorphus somalicus*, Somaliland, KERREMANS, p. 504, Ann. Mus. Genova, xxxix, n. sp.
- Cyphogastra nigrita*, *viridis*, New Guinea, *lateralis*, Ombay, p. 116, *cupripennis*, New Britain, p. 117, *impressa*, Ombay, p. 118, KERREMANS, Ann. Soc. ent. Belgique, xlii, n. spp.
- Coræbus amethystinus*, habits, H. DU BUYSSON, p. 368, Bull. Soc. ent. France, 1898; *C. bifasciatus*, habits, injurious at Nîmes, MINGAUD (862).
- C. insignis*, Madagascar, KERREMANS, p. 83, Bull. Soc. ent. France, 1898; *C. madecassus*, Madagascar, FAIRMAIRE, p. 229, Ann. Soc. ent. Belgique, xlii; *C. magnus*, Nias isld., KERREMANS, p. 156, Ann. Soc. ent. Belgique, xlii : n. spp.
- Deudora*, subg. n. of *Sphenoptera*, q. v., JAKOWLEFF, p. 325, Horæ Soc. ent. Ross. xxxii.
- Ethon diversum*, Australia, KERREMANS, p. 156, Ann. Soc. ent. Belgique, xlii, n. sp.
- Evides aenea*, Usagara, KERREMANS, p. 274, t. c., n. sp.
- Galbella cuneiformis*, Zanzibar, KERREMANS, p. 329, t. c., n. sp.
- Hoplandrocneme*, subg. n. of *Sphenoptera*, q. v.
- Hypocisseis aeneipes*, Australia, KERREMANS, p. 173, Ann. Soc. ent. Belgique, xlii, n. sp.
- Iridotænia auripennis*, Nias island, KERREMANS, p. 113, t. c., n. sp.
- Julodis oberthuri*, Kirghisia, KERREMANS, p. 134, t. c.; *J. amœna*, p. 183, *schlechteri*, p. 184, S. Africa, PÉRINGUEY, Bull. Soc. ent. France, 1898 : n. spp.
- Kamosia*, n. g., p. 314, near *Amorphosoma*, for *K. duvivieri*, *meridionalis*, n. spp., Africa, p. 315, KERREMANS, Ann. Soc. ent. Belgique, xlii.
- Kisanthobia ariasi*, var. *curta*, PIC, p. 92, Rev. Sci. Bourbon, xi.

- Melanophila decastigma*, var. *anatolica*, PIC, p. 92, Rev. Sci. Bourbon, xi.
- Melibæus sacchii*, Somaliland, KERREMANS, p. 504, Ann. Mus. Genova, xxxix; *M. leonensis*, *congolanus*, p. 315, *transvalensis*, *nitidiventris*, p. 316, *somalicus*, p. 317, Africa, KERREMANS, Ann. Soc. ent. Belgique, xlii : n. spp.
- Melobasis melanura*, *cupricollis*, p. 121, *cuprina*, *nitidiventris*, p. 122, *violacea*, *cæruleiventris*, p. 123, *viridiventris*, *costipennis*, p. 124, *concolor*, *callichloris*, p. 125, *vicina*, *laticeps*, p. 126, *terminata*, *viridicollis*, p. 127, *auronotata*, p. 127, *miranda*, *amabilis*, p. 128, Australia, KERREMANS, t. c., n. spp.
- Paracephala crassa*, p. 176, *intermedia*, *cylindrica*, *minuta*, p. 177, Australia, KERREMANS, t. c., n. spp.
- Paracupta auricollis*, New Guinea, KERREMANS, p. 115, t. c., n. sp.
- Paratania fairmairei*, Gaboon, KERREMANS, p. 275, t. c., n. sp.
- Phænops knoteki*, Herzegovina, FAUST, p. 345, Deutsche ent. Zeitschr. 1898, n. sp.
- Phlocteis cyaniventris*, Mozambique, KERREMANS, p. 317, Ann. Soc. ent. Belgique, xlii, n. sp.
- Polybothris auritarsis*, p. 78, *acuminata*, p. 79, *chalybeopicta*, *nigra*, p. 80, *chrysozona*, p. 81, Madagascar, KERREMANS, Bull. Soc. ent. France, 1898, n. spp.
- Polycesta viridis*, p. 305, *duvivieri*, p. 306, Africa, KERREMANS, Ann. Soc. ent. Belgique, xlii, n. spp.
- Pseudagrilus leonensis*, *subfasciatus*, Africa, KERREMANS, p. 318, t. c., n. spp.
- Pseudochrysodema iris*, Banda, *cupriventris*, Macassar, FAIRMAIRE, p. 114, Ann. Soc. ent. Belgique, xlii, n. spp.
- Psiloptera gestroi*, Somaliland, KERREMANS, p. 503, Ann. Mus. Genova, xxxix; *P. marginata*, *guttulata*, Usambara, KRAATZ, Deutsche ent. Zeitschr. 1898; *P. jægeri*, *intermedia*, p. 276, *sublimbalis*, p. 277, *liberta*, p. 278, *confinis*, p. 279, *cyanea*, p. 280, *rubrocincta*, p. 281, *nigroaenea*, p. 282, Africa, KERREMANS, Ann. Soc. ent. Belgique, xlii : n. spp.
- Sphenoptera paradoxa*, Biskra, ABEILLE, p. 255, Bull. Soc. ent. France, 1898; *S. (Chrysoblemma) schneideri*, p. 11, *bifulgida*, p. 12, Buchara, REITTER, Wien. ent. Zeit. xvii; *S. (Deudora*, subg. n.) *acuminata*, Persia, *satelles*, Transcaucasus, JAKOWLEFF, p. 331, Horæ Soc. Ross. xxxii; *S. astuta*, Amasia, p. 549, *signifera*, Ferghana, p. 551, *subtilis*, Astrabad, p. 552, *torrida*, Tokat, p. 553, *eugenii*, Transcaucasus, p. 554, *notata*, Alai, p. 556, *violacea*, p. 557, *cyanea*, p. 558, Askhabad, *S. (Cyphostetha) cærulea*, p. 559, Persia, JAKOWLEFF, t. c.; *S. (Hoplandrocneme*, subg. n.) *sagitta*, Transcaspien, SEMENOW, p. 651, Horæ Soc. Ross. xxxii; *S. perrieri*, Madagascar, FAIRMAIRE, p. 228, Ann. Soc. ent. Belgique, xlii; *S. insularis*, Madagascar, KERREMANS, p. 82, Bull. Soc. ent. France, 1898; *S. nitens*, Aden, p. 118, *inermis*, p. 119, *chinensis*, p. 120, China, KERREMANS, Ann. Soc. ent. Belgique, xlii; *S. ocularis*, *punctata*, p. 285, *rugosicollis*, *sublevis*, p. 286, *cylindrica*, *tropica*, p. 287, *duvivieri*, p. 288, *piscis*, *humilis*, p. 289, *humeralis*, p. 290, *nyassica*, *subnitida*, p. 291, *molirensis*, p. 292, *dissimilis*, *clara*, p. 293, *cæca*, *comes*, p. 294, *congener*, *rectipennis*, p. 295, *insipida*, p. 296, *nigripennis*, *tschoffeni*, p. 297, *divergens*, p. 298, *variolosa*, p. 299, Africa, KERREMANS, Ann. Soc. ent. Belgique, xlii : n. spp.
- Sternocera duvivieri*, p. 312, *colmanti*, p. 313, Africa, KERREMANS, t. c., n. spp.
- Stigmodera cincticollis*, p. 134, *æstimata*, p. 135, *sincera*, *cognata*, p. 136, *speciosa*, *triangulosa*, p. 137, *cupida*, p. 138, *campestris*, *observans*, p. 139, *agrestis*, *fairmairei*, p. 140, *affabilis*, *colorata*, p. 141, *felix*, *acuminata*, p. 142, *placens*, *vigilans*, p. 143, *baliola*, p. 144, *uniformis*,

deliciosa, p. 145, *laudabilis*, *verax*, p. 146, *timida*, *puerilis*, p. 147, *sensitiva*, p. 148, *consularis*, *addenda*, p. 149, *unica*, *generosa*, p. 150, *confinis*, p. 151, *prudens*, *bucolica*, p. 152, *tacita*, *lætabilis*, p. 153, *rustica*, *electa*, p. 154, *mansueta*, *ocularis*, p. 155, Australia, KERREMANS, *t. c.*, n. spp.

Torresita parallela, Queensland, KERREMANS, p. 120, *t. c.*, n. sp.

Trachys parallela, Somaliland, KERREMANS, p. 505, Ann. Mus. Genova, xxxix; *T. chinensis*, Hong Kong, *sumbawana*, Sumbawa, p. 181, *palawana*, Palawan, p. 182, KERREMANS, Ann. Soc. ent. Belgique, xlii : n. spp.

EUCNEMIDÆ, THROSCIDÆ.

[Cf. ABEILLE (1), FAIRMAIRE (368), FLEUTIAUX (394, 395, 397), HELLER (532).]

Arhipis albertisi, characters amended, FLEUTIAUX, p. 233, Termes. Fuzetek, xxi.

Compsoenemis raffrayi, New Guinea, FLEUTIAUX, p. 30, Bull. Mus. Paris, 1898, n. sp.

Dromæolus incertus, New Guinea, FLEUTIAUX, p. 27, *t. c.*, n. sp.

Fornax unicus, *doriai*, referred to *Dromæolus*; *F. morosus* = (*niger* Fl.), FLEUTIAUX, p. 572, Ann. Mus. Genova, xxxix.

F. brassai, Congo, p. 27, *bipartitus*, New Guinea, p. 28, FLEUTIAUX, Bull. Mus. Paris, 1898; *F. attenuatus*, Burma, FLEUTIAUX, p. 571, Ann. Mus. Genova, xxxix; *F. cedonulli*, Celebes, HELLER, pl. iii, fig. 4, Abh. Mus. Dresden, vii, No. 3, p. 29 : n. spp.

Mesogenus siamensis, Bangkok, FLEUTIAUX, p. 31, Bull. Mus. Paris, 1898, n. sp.

Microhagus biroi, New Guinea, FLEUTIAUX, p. 233, Termes. Fuzetek, xxi, n. sp.

Phanerochila, referred to *Ptinidæ*, FLEUTIAUX, p. 313, Bull. Soc. ent. France, 1898.

Prosopotropis, n. g., p. 35, for *P. devillei*, n. sp., Alpes maritimes, p. 36, ABEILLE, Bull. Soc. ent. France, 1898.

Raapia, n.g., p. 569, for *R. galboides*, n. sp., Nias Island, p. 570, FLEUTIAUX, Ann. Mus. Genova, xxxix.

Scython apicalis macassarus, subsp. n., pl. iii, fig. 2, p. 29, HELLER, Abh. Mus. Dresden, vii, No. 3.

Throscus madagascariensis, Madagascar, FAIRMAIRE, p. 231, Ann. Soc. ent. Belgique, xlii, n. sp.

ELATERIDÆ.

[Cf. BUYSSON (164–166), CALVERT (175), CANDÈZE (181), DUBOIS (317), FALL (372), FLEUTIAUX (395, 396), HELLER (532), HOLMGREN (549), REITTER (1002, 1015), SCHWARZ (1092–1096).]

The divisions of the family and the characters of *Deromecus* and *Protelater*, FLEUTIAUX, Bull. Soc. Zool. France, 1898, pp. 179–185.

Physiology of luminescence; information as to *Pyrophorus*, DUBOIS (317).

The bursa copulatrix in 38 species, HOLMGREN, Ent. Tidskr. xix, pp. 161–176, pls. iii, iv.

Revision of Elateridæ of Chili, CALVERT (175).

Agonischius dolosus, *mutabilis*, Assam, SCHWARZ, p. 153, Deutsche ent. Zeitschr. 1898, n. spp.

Alaus truncatipennis, note on, KRAATZ, p. 416, Deutsche ent. Zeitschr. 1898.

- A. propinquus*, *gibberosus*, Africa, SCHWARZ, p. 412, Deutsche ent. Zeitschr. 1898; *A. intermedius*, Africa, KRAATZ, p. 414 (cf. SCHWARZ, p. 415), *t. c.*; *A. keili*, Sumatra, CANDÈZE, p. 63, Notes Leyden Mus. xx : n. spp.
- Anchastus weisei*, Usambara, SCHWARZ, p. 190, Deutsche ent. Zeitschr. 1898, n. sp.
- A. championi*, Mexico, SCHWARZ, p. 147, *t. c.*, n. sp.
- Anoptischiopsis divisus*, Mexico, SCHWARZ, p. 141, Deutsche ent. Zeitschr. 1898, n. sp.
- Athoomorphus*, n. g., *Campylides*, for *A. cylindricus*, n. sp., Orange Riv., SCHWARZ, p. 156, Deutsche Ent. Zeitschr. 1898.
- Athous exceptus*, Assam, SCHWARZ, p. 152, Deutsche ent. Zeitschr. 1898; *A. pici*, Tangier, BUYSSON, p. 238, Bull. Soc. ent. France, 1898, n. spp.
- Cardiophorus demaisonii*, Egypt, BUYSSON, p. 323, *t. c.*; *C. (Craspedonotus*, nov. gen.) *rufiventris*, p. 148, *semirufus*, p. 149, *minutissimus*, p. 150, Cameroons, SCHWARZ, Deutsche ent. Zeitschr. 1898; *C. nigripes*, p. 191, *basalis*, p. 192, Usambara, SCHWARZ, *t. c.* : n. spp.
- Centrostethus*, n. n., for *Enoploderes* (infra), SCHWARZ, p. 414, *t. c.*
- Chalcolepideies tartarus*, Yuma, FALL, p. 238, Ent. News Philad. 1898, n. sp.
- Craspedonotus*, n. g., cf. *Cardiophorus*.
- Craspedostethus*, n. n., for the above *Craspedonotus*, *id.*, *t. c.* p. 414.
- Deromecus parallelus*, Sol., redescribed and referred to *Protelater*, FLEUTIAUX, p. 183, Bull. Soc. zool. France, 1898.
- Elater demaisonii*, Anatolia, H. DU BUYSSON, p. 367, Bull. Soc. ent. France, 1898, n. sp.
- Elathous schwarzi*, Asia Minor, REITTER, p. 346, Deutsche ent. Zeitschr. 1898, n. sp.
- Enoploderes*, n. g. (cf. *Centrostethus*, supra), for *Tilotarsus cuspidatus* Klug, SCHWARZ, p. 131, Deutsche ent. Zeitschr. 1898.
- Glyphonyx africanus*, Cameroons, p. 154, *angusticollis*, Assam, p. 155, SCHWARZ, *t. c.*, n. spp.
- Hemicleus dorsalis*, Cameroons, SCHWARZ, p. 129, *t. c.*; *H. weisei*, *apicalis*, Usambara, SCHWARZ, p. 183, *t. c.* : n. spp.
- Hemiops bicolor*, Celebes, HELLER, p. 30, Abh. Mus. Dresden, vii, No. 3, n. sp.
- Hemirrhaphus quadriguttatus*, Cameroons, SCHWARZ, p. 148, Deutsche ent. Zeitschr. 1898, n. sp.
- Heteroderes multimaculatus*, Usambara, SCHWARZ, p. 189, *t. c.*, n. sp.
- Lacon longipennis*, Madagascar, SCHWARZ, p. 130, *t. c.*; *L. fastigiatus*, *weisei*, p. 185, *pusillus*, p. 186, Usambara, SCHWARZ, *t. c.* : n. spp.
- Lobotarsus*, n. g., p. 130, for part of *Tilotarsus*, with *L. decoratus*, p. 131, *subtuberculatus*, p. 132, *minutus*, p. 133, n. spp., Cameroons, SCHWARZ, *t. c.*
- Ludius bennigseni*, E. Africa, *lineatocollis*, W. Africa, p. 410, *tenebrosus*, Java, p. 411, SCHWARZ, *t. c.*, n. spp.
- Lycoreus maculipennis*, Madagascar, SCHWARZ, p. 134, *t. c.*, n. sp.
- Megapenthes*, characters of European, REITTER, p. 180, Ent. Nachr. xxiv.
- M. opacofulvus*, Ordubad, *id.* p. 181, *t. c.*; *M. octomaculatus*, Assam, SCHWARZ, p. 144, Deutsche ent. Zeitschr. 1898 : n. spp.
- Melanotus pellitus*, Borneo, SCHWARZ, p. 151, *t. c.*, n. sp.
- Melanoxanthus ramusculus*, p. 63, *puerulus*, p. 64, Lombok, CANDÈZE, Notes Leyden Mus. xx; *M. discicollis*, p. 145, *ustulatus*, p. 146, Cameroons, SCHWARZ, Deutsche ent. Zeitschr. 1898 : n. spp.
- Melanthoides apicalis*, Cameroons, SCHWARZ, p. 141, *t. c.*, n. sp.
- Phedomenus angularis*, p. 142, *niger*, p. 143, Cameroons, SCHWARZ, *t. c.*, n. spp.

Protelater germaini, Chili, FLEUTIAUX, p. 184, Bull. Soc. zool. France, 1898, n. sp.

Psephus inflatus, p. 135, *rubripennis*, *filicornis*, p. 136, *laticornis*, p. 137, *circumcinctus*, *semirugulosus*, p. 138, *serratipennis*, p. 139, Cameroons, *nigrolimbatus*, p. 140, Dar-es-Salaam, SCHWARZ, Deutsche ent. Zeitschr. 1898 ; *P. ferrugineus*, p. 187, *agriotiformis*, *athoiformis*, p. 188, Usambara, SCHWARZ, t. c., n. spp.

DASCILLIDÆ.

[Cf. FAIRMAIRE (359), PIC (953, 967), REITTER (1005).]

Helodes pallidithorax, Akbès, *corsicus*, Corsica, PIC, p. 137, Misc. Ent. vi ; *H. akbesianus*, Syria, PIC, p. 26, Feuille Natural. xxix ; n. spp.

Lichas subocellata, *fasciolata*, Borneo, *baeri*, Luzon, FAIRMAIRE, p. 388, Ann. Soc. ent. France, lxxvii, n. spp.

Scyrtes fulviculus, Lenkoran, REITTER, p. 121, Wien. ent. Zeit. xvii, n. sp.

MALACODERMIDÆ, incl. MELYRIDÆ.

[Cf. ABEILLE (2), ALLUAUD (14), BOURGEOIS (132), CHOBOUT (204), DUBOIS (317), FAIRMAIRE (359, 368, 369, 370), GORHAM (477), OLIVIER (904), PIC (946, 953, 966, 967), REITTER (1002, 1005), SAINTE-CLAIRE-DEVILLE (1057), SPAETH (1168), UHAGON (1249).]

Notes on luminescence, DUBOIS (317).

Distribution of *Lampyrides* in the Antilles, OLIVIER (904).

Aspidosoma superciliosum, St. Vincent, GORHAM, p. 318, P. Zool. Soc. London, 1898, n. sp.

Astylus antillarum, St. Vincent, GORHAM, p. 323, pl. xxvii, fig. 7, t. c., n. sp.

Attalus transmarinus, n. n., for *subfasciatus*, FALL, FALL, p. 267, Canad. Ent. xxx.

A. atrocyaneus, *laufferi*, Spain, UHAGON, p. 41, Actas Soc. espana, 1898 ; *A. bayonnei*, *diversicollis*, Algeria, CHOBOUT, p. 77, Rev. Ent. franc. xvii ; *A. kabylianus*, Algeria, PIC, p. 137, Miscell. Ent. vi : n. spp.

Calopteron smithi, pl. xxvii, fig. 2, St. Vincent, p. 315, *oblitum*, Grenada, p. 316, GORHAM, P. Zool. Soc. London, 1898, n. spp.

Calotroglops niveus, Biskra, ABEILLE, p. 256, Bull. Soc. ent. France, 1898, n. sp.

Cantharis curtipennis, Akbès, REITTER, p. 346, Deutsche ent. Zeitschr. 1898 ; *C. caspica*, N. Persia, p. 122, *dia*, Thian-Schan, p. 123, REITTER, Wien. ent. Zeit. xvii : n. spp.

Cladophorus (Odontocerus) carbonarius, Malacca, BOURGEOIS, p. 92, Bull. Soc. ent. France, 1898, n. sp.

Colotes hispanus, Granada, UHAGON, p. 41, Actas Soc. espana, 1898, n. sp.

Dasytes diabolicus, Algeria, CHOBOUT, p. 79, Rev. Ent. franc. xvii, n. sp.

Donaldia, n. g., p. 102, near *Xamerpus*, for *D. elegans*, n. sp., Mauritius, p. 103, ALLUAUD, Bull. Soc. ent. France, 1898.

Drilus flavescens, *mauritanicus*, habits, EVERTS, Tijdschr. Ent. xli, Verslag, p. 3.

Ebæus imbellis, Madagascar, FAIRMAIRE, p. 476, Ann. Soc. ent. Belgique, xlii ; *E. nigrocæruleus*, St. Vincent, GORHAM, p. 323, P. Zool. Soc. London, 1898 : n. spp.

- Hapalochrous vaulogeri*, Biskra, ABEILLE, p. 257, Bull. Soc. ent. France, 1898, n. sp.
- Haplocnemus mohammed*, Algeria, CHOBOUT, p. 78, Rev. Ent. franc. xvii, n. sp.
- Homalilus* (*Phæopterus*) *flavangulus*, Croatia, SPAETH, p. 657, Verh. Ges. Wien, 1898, n. sp.
- Hovacnemus*, n. g., p. 232, near *Cerallus*, for *H. pallitarsis*, n. sp., Madagascar, p. 233, FAIRMAIRE, Ann. Soc. ent. Belgique, xlii.
- Laius baeri*, Philippines, FAIRMAIRE, p. 389, Ann. Soc. ent. France, lxvii, n. sp.
- Libnetis pusillus*, Malacca, BOURGEOIS, p. 92, Bull. Soc. ent. France, 1898, n. sp.
- Luciola spilodera*, var. n., *cyathigera*, FAIRMAIRE, p. 405, Ann. Soc. ent. Belgique, xlii.
- L. fasciventris*, Madagascar, FAIRMAIRE, p. 231, t. c., n. sp.
- Lycus proboscideus*, *foliaceus*, characters and synonymy, BOURGEOIS, pp. 90, 91, Bull. Soc. ent. France, 1898.
- Macrotelus maculicollis*, Madagascar, FAIRMAIRE, p. 232, Ann. Soc. ent. Belgique, xlii, n. sp.
- Malachius maculithorax*, Tangier, PIC, p. 28, Feuille Natural. xxix; *M. akbesianus*, Syria, PIC, p. 138, Miscell. ent. vi; *M. phereclus*, Ordubad, REITTER, p. 123, Wien. ent. Zeit. xvii : n. spp.
- Malthinus filicornis*=(*maculiventris* Fairm.), PIC, p. 335, Bull. Soc. ent. France, 1898.
- M. devillei*, Alpes maritimes, ABEILLE, p. 92, Abeille, xxix, n. sp.
- Melyris rotundicollis*, var. n., *pallidipes*, PIC, p. 273, Naturaliste, 1898.
- Melyrodes cupripennis*, Costa Rica, PIC, p. 273, t. c., n. sp.
- Microjulistus gibbipennis*, Algeria, CHOBOUT, p. 80, Rev. Ent. franc. xvii, n. sp.
- Ovalampis*, n. g., near *Photinus*, for *O. crispaticollis*, n. sp., Madagascar, FAIRMAIRE, Ann. Soc. ent. Belgique, xlii, p. 404.
- Pelecophora subglabra*, p. 99, *antelmei*, p. 100, *interrupta*, Mauritius, *obliquata*, with var. *charmoyi*, Réunion, p. 101, ALLUAUD, Bull. Soc. ent. France, 1898, n. spp.
- Photinus notatus*, St. Vincent, GORHAM, p. 319, pl. xxvii, fig. 3, P. Zool. Soc. London, 1898, n. sp.
- Plateros palliatus*, *fraternus*, St. Vincent, GORHAM, p. 317, t. c., n. spp.
- Pseudozygia*, n. g., for *P. rubricollis*, n. sp., Somaliland, PIC, p. 506, Ann. Mus. Genova, xxxix.
- Rhagonycha latipennis*, p. 138, *delagrangii*, p. 139, Syria, PIC, Miscell. ent. vi; *R. (Armidia) nigroterminata*, Akbès, REITTER, p. 346, Deutsche ent. Zeitschr. 1898 : n. spp.
- Silis mandibularis*, *rotundicollis*, p. 405, *hæmatodera*, *dæmoniformis*, p. 406, Madagascar, FAIRMAIRE, Ann. Soc. ent. Belgique, xlii; *S. tenella*, St. Vincent, GORHAM, p. 321, P. Zool. Soc. London, 1898 : n. spp.
- Telephorus tokatensis*, Tokat, PIC, p. 138, Miscell. Ent. vi, n. sp.
- Troglops vestitus*, Biskra, ABEILLE, p. 256, Bull. Soc. ent. France, 1898, n. sp.
- Tylocerus lineatus*, St. Vincent, GORHAM, p. 320, P. Zool. Soc. London, 1898, n. sp.
- Xamerpus fairmairei*, Madagascar, ALLUAUD, p. 103, Bull. Soc. ent. France, 1898; *X. martini*, *bourgeoisii*, Madagascar, FAIRMAIRE, p. 476, Ann. Soc. ent. Belgique, xlii : n. spp.
- Zarhipis integripennis*, ♀ noticed, RICKSECKER, p. 179, Psyche, viii.
- Zygia femoralis*, Zanzibar, PIC, p. 273, Naturaliste, 1898; *Z. gestroi*, p. 507, *ruspolii*, p. 508, *albicoma*, p. 509, Somaliland, PIC, Ann. Mus. Genova, xxxix : n. spp.

CLERIDÆ.

[Cf. BORDAS (128), FAIRMAIRE (370), SCHENKLING (1068–1070).]

The internal sexual structures of male *Cleridæ*, BORDAS (128).

Clerus bellus, Bolivia, SCHENKLING, p. 365, Deutsche ent. Zeitschr. 1898, n. sp.

Cylidrus intermedius, Sumatra, SCHENKLING, p. 361, t. c., n. sp.

Denops bimaculatus, Somaliland, SCHENKLING, p. 545, Ann. Mus. Genova, xxxix, n. sp.

Emmepus juncicola, Biskra, ABEILLE, p. 255, Bull. Soc. ent. France, 1898, n. sp.

Hydnocera fulvipennis, Guatemala, SCHENKLING, p. 366, Deutsche ent. Zeitschr. 1898, n. sp.

Lebasiella discolor, var. n., *tibialis*, SCHENKLING, p. 368, t. c.

Lemidia, revision of the genus, SCHENKLING, pp. 169–182, Deutsche ent. Zeitschr. 1898.

L. gorhami, Australia, p. 174, *gracilis*, Tasmania, p. 178, *id.*, t. c., n. spp.

Ommadius nitidus, Ceram, SCHENKLING, p. 366, t. c., n. sp.

Opetiopalpus sabulosus, var. n., *obscuricollis*, SCHENKLING, p. 368, Deutsche ent. Zeitschr. 1898.

O. nigriceps, Somaliland, SCHENKLING, p. 549, Ann. Mus. Genova, xxxix; *O. quadriimpressus*, Madagascar, FAIRMAIRE, p. 407, Ann. Soc. ent. Belgique, xlii; *O. fuscipennis*, Madagascar, FAIRMAIRE, p. 477, t. c., n. spp.

Opilo floccosus, Australia, SCHENKLING, p. 363, Deutsche ent. Zeitschr. 1898, n. sp.

Paratillus carus, varr. = (*basalis*, *analisis* Gorh.), SCHENKLING, p. 368, t. c.

Pelonium insulare, St. Vincent, GORHAM, p. 322, P. Zool. Soc. London, 1898, n. sp.

Phlæocopus apicalis, Somaliland, SCHENKLING, p. 547, Ann. Mus. Genova, xxxix, n. sp.

Platynoptera suturalis, Bolivia, SCHENKLING, p. 367, Deutsche ent. Zeitschr. 1898, n. sp.

Pæcilochoa rufipes, Mexico, SCHENKLING, p. 364, t. c., n. sp.

Priocera spinolæ, var. n. *similis*, SCHENKLING, p. 362, t. c.

Stigmatium setigerum, Somaliland, SCHENKLING, p. 548, Ann. Mus. Genova, xxxix, n. sp.

Tillus notatus = (*semperanus* Gorh. = *lewisi* Kies.), SCHENKLING, p. 361, Deutsche ent. Zeitschr. 1898.

T. humeralis, Somaliland, SCHENKLING, p. 546, Ann. Mus. Genova, xxxix, n. sp.

Trichodes, synonymy of numerous, CHAMPENOIS, pp. 115, 116, Abeille, xxix.

Trogodendron monstrosus ♀, SCHENKLING, p. 365, Deutsche ent. Zeitschr. 1898, n. sp.

CUPESIDÆ.

Paracupes, n. g., p. 179, for *P. brasiliensis*, n. sp., Brazil, p. 180, KOLBE, Ent. Nachr. xxiv.

PTINIDÆ.

[Cf. CASEY (190), GORHAM (477), PIC (946, 949, 950, 964), REITTER (1012), SCHILSKY (1072, 1073), SEIDLITZ (1106).]

Supplement to Ptinidæ in Insecten Deutschlands, SEIDLITZ, Ins. Deutschl. 5 (1), pp. 801–812.

- Cænocara weisei*, E. Africa, SCHILSKY, p. 271, Deutsche ent. Zeitschr. 1898, n. sp.
- Episernus sulcicollis*, 16, *ganglbaueri*, 18, Europe, SCHILSKY, Käf. Eur. xxxv, n. spp.
- Euceratocerus pleuralis*, *macer*, *saginat*, N. America, CASEY, p. 65, J. N. York ent. Soc. vi, n. spp.
- Hedobia*, table of European, REITTER, pp. 137–139, Wien. ent. Zeit. xvii.
- H. belia*, Lenkoran, *id.* p. 139, t. c.; *H. quinquecostata*, Syria, SCHILSKY, Käf. Eur. xxxv, 55 : n. spp.
- Lasioderma puberulum*, St. Vincent, GORHAM, p. 326, P. Zool. Soc. London, 1898, n. sp.
- Metholcus rotundicollis*, Syria, SCHILSKY, Käf. Eur. xxxv, 72, n. sp.
- Meziomorphum*, n. g. for *Mezium echinatum* Pér., PIC, p. 169, Bull. Soc. zool. France, 1898.
- Microptinus brunneus*, Tunis, PIC, p. 73, Miscell. Ent. vi, n. sp.
- Mirosternus laevis*, St. Vincent, GORHAM, p. 327, pl. xxvii, fig. 5, P. Zool. Soc. London, 1898, n. sp.
- Oligomerus retowskii*, Caucasus, SCHILSKY, Käf. Eur. xxxv, 32, n. sp.
- Phanerochila*, described as Eucnemid, belongs to *Anobiidae*, near *Ptilinus*, FLEUTIAUX, p. 313, Bull. Soc. ent. France, 1898.
- Ptilinus lobatus*, p. 62, *pruin*, *acuminatus*, *ramicornis*, p. 63, *flavipennis*, p. 64, N. America, CASEY, J. N. York ent. Soc. vi, n. spp.
- Ptinus coquereli*, referred to *Pseudomezium*, PIC, p. 12, Bull. Soc. ent. France, 1898.
- P. ruspolii*, Somaliland, PIC, p. 509, Ann. Mus. Genova, xxxix; *P. brevis*, p. 395, Réunion, *vestitus*, *metallicus*, p. 396, *P. (Diegosus) griseofasciatus*, p. 397, *rubripes*, *darutyi*, p. 398, *P. mauritiensis*, p. 399, *emmerezi*, *impressus*, p. 400, Mauritius, PIC, Ann. Soc. ent. France, lxvi; *P. tessellatus*, Grenadines, GORHAM, p. 324, pl. xxvii, fig. 8, P. Zool. Soc. London, 1898; *P. semibrunneus*, p. 170, *theresæ*, *donckieri*, p. 171, *goyasensis*, *vittatus*, p. 172, Brazil, PIC, Bull. Soc. zool. France, 1898 : n. spp.
- Synanobium*, n. g. for *S. ganglbaueri*, n. sp., Beirut, SCHILSKY, Käf. Eur. xxxv, 22, n. sp.

CLOIDÆ, SPHINDIDÆ, LYCTIDÆ.

[Cf. CASEY (190), GORHAM (477), LESNE (771).]

- Brachycis*, n. g., p. 86, for *B. brevicollis*, n. sp., New York, p. 87, CASEY, J. N. York ent. Soc. vi.
- Ceracis unicornis*, *bifurcus*, pl. xxvii, fig. 10, St. Vincent, GORHAM, p. 332, P. Zool. Soc. London, 1898, n. spp.
- Cis carolinæ*, *pallens*, p. 78, *impressa*, *pistoria*, *striolata*, p. 79, *fraterna*, *macilent*, *versicolor*, p. 80, *mormonica*, *horridula*, *illustris*, p. 81, *congesta*, *duplex*, *hystri*, *montana*, p. 82, *soror*, *curtula*, *hirsuta*, *ursulina*, p. 83, N. America, CASEY, J. N. York ent. Soc. vi; *C. pusillus*, Grenadines, p. 330, *nubilus*, St. Vincent, p. 331, GORHAM, P. Zool. Soc. London, 1898 : n. spp.
- Ennearthron piceum*, p. 88, *laminifrons*, *grossulum*, *discolor*, *convergens*, p. 89, *pullulum*, *unicorne*, p. 90, N. America, CASEY, J. N. York ent. Soc. vi, n. spp.
- Eutomus sulcatus*, St. Vincent, GORHAM, p. 333, Z. Zool. Soc. London, 1898, n. sp.
- Lyctus canaliculatus* boring through lead, Bull. Dep. Agric. Ent. x, p. 88; habits and life-history, XAMBEU, Bull. Soc. Ouest France, viii, pp. 69–72.
- L. cornifrons*, Obock, LESNE, p. 139, Bull. Mus. Paris, 1898, n. sp.

- Octotemnus denudatus, lævis*, N. America, CASEY, p. 91, J. N. York ent. Soc. vi, n. sp.
Odontosphindus clavicornis, California, CASEY, p. 92, *t. c.*, n. sp.
Orthocis, n. g. for *C. punctata* M. and *O. aterrima*, n. sp., California, CASEY, p. 84, *t. c.*
Plesiocis, n. g., for *P. cribrum*, n. sp., California, CASEY, p. 87, *t. c.*
Sphindus crassulus, trinifer, N. America, CASEY, p. 93, *t. c.*, n. spp.
Xestocis, n. g., for *C. biarmata* Mann. and *X. levettei*, miles, p. 85, *insolens, opalescens*, p. 86, n. spp., N. America, CASEY, *t. c.*

BOSTRYCHIDÆ.

[*Cf.* CASEY (190), CHOBAUT (204), GORHAM (477), LESNE (769, 770, 774), LINELL (788), REITTER (1003).]

- Revision of the tribe *Bostrychina*, LESNE, Ann. Soc. ent. France, lxvii, pp. 438–621, and division into three subtribes, *Sinoxylonina*, *Apatina*, *Bostrychina*, pp. 439, 440, *t. c.*
Amphicerus maritimus, p. 68, *grandicollis*, p. 69, *brevicollis*, p. 70, Texas, CASEY, J. N. York ent. Soc. vi; *A. frontalis*, Brazil, LINELL, p. 257, P. U. S. Mus. xxi : n. spp.
Apatides, n. g., p. 70, for *Amph. fortis* Lec., and *A. robustus, puncticeps*, n. spp., N. America, p. 71, CASEY, J. N. York ent. Soc. vi.
Bostrychoplites, n. g., p. 565, for part of *Bostrychus*, with *B. megaceros*, p. 574, *valens*, p. 578, *armatus*, p. 579, *dicerus, peltatus*, p. 580, n. spp., Africa, LESNE, Ann. Soc. ent. France, lxvii.
Bostrychopsis, n. g., p. 524, for part of *Bostrychus*, and *B. affinis*, Formosa, p. 536, *valida, ganglbaueri*, p. 544, *trimorpha*, p. 550, S. America, n. spp., LESNE, *t. c.*
B. castelnani, orbigny, gounellei, ? trimorphic females of *uncinata* or n. spp., LESNE, pp. 545–549, Ann. Soc. ent. France, lxvii.
Bostrychulus, n. g., p. 591, with *B. quadraticollis*, Guyana, p. 597, *brasiliensis*, Brazil, p. 599, *exiguus*, Colombia, p. 602, *fuscus*, Cuba, Centr. America, p. 603, *ater*, p. 606, *horni*, p. 607, *cribripennis*, p. 608, *germaini*, p. 609, *brevipes*, p. 613, *obesus*, p. 614, Brazil, *ampliocollis*, Paraguay, p. 615, n. spp., LESNE, *t. c.*
Bostrychus malayanus, Malacca, etc., LESNE, p. 255, Notes Leyden Mus. xx; *B. angustus*, N. America, CASEY, p. 72, J. N. York ent. Soc. vi : n. spp.
Dendrobiella, n. g., for part of *Sinoxylon*, and *D. pubescens*, Texas, *sublævis*, Jamaica, n. spp., CASEY, p. 67, *t. c.*
Dexicrates, n. g., for *Bostrychus robustus* Bl., LESNE, p. 455, Ann. Soc. ent. France, lxvii.
Dinoderus nitidus, pilifrons, noticed, LESNE, p. 637, Ann. Mus. Genova, xxxix.
D. papuanus, New Guinea, LESNE, p. 636, *t. c.*; *D. pacificus, sobrinus, asperulus*, p. 74, *amplus, opacus, hispidulus, parvulus*, p. 75, N. America, CASEY, J. N. York ent. Soc. vi : n. spp.
Dolichobostrychus, subg. n., cf. *Neoterius*.
Heterarthron feanus, Tenasserim, LESNE, p. 634, Ann. Mus. Genova, xxxix, n. sp.
Heterobostrychus, n. g., p. 554, for pt. of *Bostrychus*, with *H. pileatus*, n. sp., E. India, Philippines, p. 559, LESNE, Ann. Soc. ent. France, lxvii.
Lichenophanes, n. g., p. 457, for part of *Bostrychus*, with *L. numida*, Algeria, p. 472, *oberthuri*, Cameroons, p. 478, *albicans*, Brazil, p. 491, *martini, perrieri*, Madagascar, p. 501, n. spp., LESNE, *t. c.*
Micrapate, n. g., p. 72, for *Sinox. dinoderoides* and *simplex* Horn, and *M. cristicauda*, n. sp., N. America, p. 73, CASEY, J. N. York ent. Soc. vi.

- Neoterius*, n. g., p. 581, for part of *Bostrychus*, with *Dolichobostrychus*, subg. n., p. 582, and *N. gracilis*, n. sp., Brazil, p. 586, LESNE, Ann. Soc. ent. France, lxvii.
- Parabostrychus*, n. g., for *B. elongatus* Lesne, LESNE, p. 590, *t. c.*
- Patea*, n. g., for *Dinoderus brevis*, CASEY, p. 66, J. N. York ent. Soc. vi.
- Rhizopertha bifoveata*, figure, pl. xxvii, fig. 9, note, p. 329, GORHAM, F. Zool. Soc. London, 1898.
- Schistoceros*, n. g., for part of *Amphicerus*, and *S. lignator*, Venezuela, p. 509, *consanguineus*, America, p. 513, n. spp., LESNE, Ann. Soc. ent. France, lxvii.
- Sinoxylodes*, n. g., p. 617, for *curtulus* Er. = (*championi* Gorh.), LESNE, *t. c.*
- Xylobiops*, n. g., for part of *Sinoxylon*, CASEY, p. 66, J. N. York ent. Soc. vi.
- Xylopertha lesnei*, Algeria, CHOBOUT, p. 81, Rev. ent. franc. xvii; *X. auricomma*, Bucharra, REITTER, p. 13, Wien. ent. Zeit. xvii : n. spp.

TENEBRIONIDÆ.

- [Cf. BIEDERMANN (92), CHOBOUT (204), DESBROCHERS (295), FAIRMAIRE (359, 360, 367–370), GESTRO (456), KRAATZ (719), LINELL (788), REITTER (1002, 1003, 1007, 1010, 1019), SEIDLITZ (1106).]
- Supplement to *Tenebrionidæ*, *Ins. Deutschl.*, SEIDLITZ, *Ins. Deutschl.* 5 (1), pp. 813–853.
- Acthosus bihamatus*, Borneo, FAIRMAIRE, p. 392, Ann. Soc. ent. France, lxvii, n. sp.
- Adelphinus ciliatus*, Algeria, SEIDLITZ, p. 853, *Ins. Deutschl.* 5 (1), n. sp.
- Aegialites stejnegeri*, Robben island, LINELL, p. 74, *Canad. Ent.* xxx, n. sp.
- Amarsenes cærulans*, Madagascar, FAIRMAIRE, p. 410, Ann. Soc. ent. Belgique, xlii, n. sp.
- Ammophorus caroli*, Galapagos, LINELL, p. 264, P. U. S. Mus. xxi, n. sp.
- Anemia*, table of species, REITTER (1019).
- A. fenyessi*, Oran, *pharao*, Egypt, REITTER (1019).
- A. fissidens*, p. 348, *chobauti*, p. 349, Algeria, REITTER, *Deutsche ent. Zeitschr.* 1898 : n. spp.
- Anisocerus funebris*, Mardin, *turkestanicus*, Taschkent, REITTER, p. 106, Wien. ent. Zeit. xvii, n. spp.
- Apolites taygetanus*, Greece, REITTER, p. 105, *t. c.*, n. sp.
- Argobrachium*, n. g., near *Hoplonyx*, for *A. impressifrons*, n. sp., W. Africa, FAIRMAIRE, p. 216, Notes Leyden Mus. xx.
- Artactes aeneipes*, Borneo, FAIRMAIRE, p. 392, Ann. Soc. ent. France, lxvii, n. sp.
- Basanus guineensis*, Cameroons, FAIRMAIRE, p. 213, Notes Leyden Mus. xx, n. sp.
- Botiras oblongulus*, N. India, FAIRMAIRE, p. 389, Ann. Soc. ent. France, lxvii, n. sp.
- Bradymerus convexicollis*, Madagascar, FAIRMAIRE, p. 478, Ann. Soc. ent. Belgique, xlii, n. sp.
- Camariodes foveipennis*, Madagascar, FAIRMAIRE, p. 480, *t. c.*, n. sp.
- Ceropria ellipsodes*, Madagascar, FAIRMAIRE, p. 408, *t. c.*, n. sp.
- Chalcostylus*, n. g., near *Nycteropus*, for *C. perrieri*, n. sp., Madagascar, FAIRMAIRE, p. 409, *t. c.*
- Chemolamus recticollis*, *sublimbalis*, Madagascar, FAIRMAIRE, p. 479, *t. c.*, n. spp.
- Chiroscelis mulleri*, E. Africa, KRAATZ, p. 400, *Deutsche ent. Zeitschr.* 1898, n. sp.
- Clastopus*, n. g., p. 407, near *Trigonopus*, for *C. eurynotoides*, n. sp., Madagascar, p. 408, FAIRMAIRE, Ann. Soc. ent. Belgique, xlii.

- Compsocula*, n. g., for *Stenogena gentilis*, Fairm., FAIRMAIRE, p. 236, *t. c.*
Crypticoides, n. g., p. 389, near *Hegeter*, for *C. mellyi*, n. sp., Thibet, p. 390, FAIRMAIRE, Ann. Soc. ent. France, lxvii.
Cryptobates crassecostatus, Labuan, FAIRMAIRE, p. 394, *t. c.*, n. sp.
Damatris laminata, Madagascar, FAIRMAIRE, p. 410, Ann. Soc. ent. Belgique, xlii; *D. parvicollis, pyrrhosoma*, FAIRMAIRE, p. 478, *t. c.* : n. spp.
Encyalesthus nitidipennis, Philippines, FAIRMAIRE, p. 394, Ann. Soc. ent. France, lxvii, n. sp.
Enganodia, n. g., ? near *Pæcilesthus*, for *E. sanguinicus*, n. sp., Philippines, FAIRMAIRE, p. 398, *t. c.*
Eucyrtus orichalceus, p. 392, *laticornis*, Borneo, *viridans*, Celebes, p. 393, FAIRMAIRE, *t. c.*, n. spp.
Gonocephalum schneideri, Buchara, REITTER, p. 14, Wien. ent. Zeit. xvii, n. sp.
Gonocnemis crassicornis, puberulus, p. 217, *tubericollis*, p. 218, *sulcicollis, rubripes*, p. 219, *seminitens*, p. 220, W. Africa, FAIRMAIRE, Notes Leyden Mus. xx, n. spp.
Heterophylus substriatus, Asia Minor, REITTER, p. 348, Deutsche ent. Zeitschr. 1898, n. sp.
Holobrachys fusicornis, Madagascar, FAIRMAIRE, p. 411, Ann. Soc. ent. Belgique, xlii, n. sp.
Hoplædipus, n. g., p. 395, for *Camarimena armipes* Fairm., and the following n. spp., *bidentulus, basicruralis*, p. 396, *heterodoxus*, p. 397, Singapore, FAIRMAIRE, Ann. Soc. ent. France, lxvii.
Hovacula, n. g., near *Stenogena*, for *H. lineolata*, n. sp., Madagascar, FAIRMAIRE, p. 236, Ann. Soc. ent. Belgique, xlii.
Hovarygmus, n. g., p. 234, near *Paramarygmus*, for *H. insularis*, n. sp., Madagascar, p. 235, FAIRMAIRE, *t. c.*
Liochrinus = (*Ades* Guér. = *Hades* Thoms.), FAIRMAIRE, p. 482, *t. c.*
L. vernicatus, Madagascar, FAIRMAIRE, p. 481, *t. c.*, n. sp.
Leptonychus sabulicola, Algeria, CHABAUT, p. 81, Rev. Ent. franc. xvii, n. sp.
Lyprochelyda, n. g., near *Lyprops*, for *L. purpurina*, n. sp., Cameroons, FAIRMAIRE, Notes Leyden Mus. xx.
Lyprops hovanus, Madagascar, FAIRMAIRE, p. 234, Ann. Soc. ent. France, 1898, n. sp.
Malacova, n. g., near *Damatris*, p. 479, for *M. bicolor, interstitialis*, n. spp., Madagascar, p. 480, FAIRMAIRE, Ann. Soc. ent. Belgique, xlii.
Mesomorphus fulvoscutatus, p. 233, *asperulus*, p. 234, Madagascar, FAIRMAIRE, *t. c.*, n. spp.
Moromelas, n. g., near *Sphærocaulus*, for *M. foveipennis*, n. sp., Madagascar, FAIRMAIRE, p. 481, *t. c.*
Ocnere tunicensis, Tunis, DESBROCHERS, p. 82, Frelon, vi, n. sp.
Ohyonthis, n. g., *Tentyriides*, for *O. microderoides*, n. sp., Asia Minor, REITTER, p. 347, Deutsche ent. Zeitschr. 1898.
Oxycara trapezicollis, Algeria, CHABAUT, p. 82, Rev. Ent. franc. xvii, n. sp.
Pachyscelis rickmersi, Buchara, REITTER, p. 13, Wien. ent. Zeit. xvii, n. sp.
Pedonæces bauri, Galapagos, LINELL, p. 265, P. U. S. Mus. xxi, n. sp.
Peltoides hovanus, Madagascar, FAIRMAIRE, p. 408, Ann. Soc. ent. Belgique, xlii, n. sp.
Phæogala breviscutata, p. 413, *laterifusca*, p. 414, Madagascar, FAIRMAIRE, *t. c.*, n. spp.
Plesiophthalmus fuscoenescens, Ishigaki, FAIRMAIRE, p. 14, Bull. Soc. ent. France, 1898, n. sp.
Pontianacus, n. g., near *Pyanisia*, for *P. rubricrus*, n. sp., Borneo, FAIRMAIRE, p. 397, Ann. Soc. ent. France, lxvii.

- Porphyryba cribricollis*, Madagascar, FAIRMAIRE, p. 411, Ann. Soc. ent. Belgique, xlii, n. sp.
Pseudasida pannosa, Madagascar, FAIRMAIRE, p. 407, t. c., n. sp.
Pseudethas, n. g., near *Ethas*, for *P. longiceps*, n. sp., Madagascar, FAIRMAIRE, p. 477, t. c.
Pseudoblaps ædipus, p. 390, *ampliata*, India, *tenuestriata*, Ceylon, p. 391, FAIRMAIRE, Ann. Soc. ent. France, lxvii, n. spp.
Pseudolamus rotundicollis, Madagascar, FAIRMAIRE, p. 478, Ann. Soc. ent. Belgique, xlii, n. sp.
Scleropatrum, tabulation of species, REITTER, pp. 36–39, Wien. ent. Zeit. xvii.
S. horridum, Mongolia, p. 37, *seidlitzii*, Turkestan, p. 39, REITTER, t. c., n. spp.
Sepidostenus fairmairei, p. 512, *ruspolii*, p. 514, *longipennis*, p. 516, *dolichopus*, p. 517, Somaliland, GESTRO, Ann. Mus. Genova, xxxix, n. spp.
Stenogena rudicollis, Madagascar, FAIRMAIRE, p. 235, Ann. Soc. ent. Belgique, xlii, n. sp.
Stomion piceum, p. 262, *bauri*, p. 263, Galapagos, LINELL, P. U. S. Mus. xxi, n. spp.
Suarezius approximans, Madagascar, FAIRMAIRE, p. 411, Ann. Soc. ent. Belgique, xlii, n. sp.
Tenebrio molitor, digestion in larva, BIEDERMANN (92).
Toxicum goliath, Borneo, FAIRMAIRE, p. 395, Ann. Soc. ent. France, lxvii, n. sp.

CISTELIDÆ, ÆGIALITIDÆ.

- [Cf. FAIRMAIRE (367, 368, 369), LINELL (786, 788), REITTER (1002, 1003, 1014).]
Allecula semilivida, characters, PIC, p. 114, Bull. Soc. ent. France, 1898.
A. limbaticornis, with var. *suturata*, Madagascar, FAIRMAIRE, p. 235, Ann. Soc. ent. Belgique, xlii, n. sp.
Cacoplesia, n. g. for *Plesia melanura* Fairm. nec Klug, which is re-described as *C. crenatostriata*, with the following n. spp., *crassicornis*, p. 237, *cærulans*, *cæruleovirens*, p. 238, Madagascar, FAIRMAIRE, t. c.
Cistela vagevittata, p. 412, *geminata*, *fuscostriata*, p. 413, Madagascar, FAIRMAIRE, t. c., n. spp.
Lobopoda galapagoensis, Galapagos, LINELL, p. 266, P. U. S. Mus. xxi, n. sp.
Morocaula, n. g., near *Allecula*, for *M. remipes*, n. sp., W. Africa, FAIRMAIRE, Notes Leyden Mus. p. 215.
Mycetocharina rufotestacea, *adusta*, Syria, *puncticollis*, Buchara, REITTER, p. 65, Ent. Nachr. xxiv.
Omophlina rubricollis, Buchara, p. 14, *seidlitzii*, Taschkent, p. 15, REITTER, Wien. ent. Zeit. xvii, n. spp.
Omophilus armillatus, var. n., *merthæ*, REITTER, p. 349, Deutsche ent. Zeitschr. 1898.

PYTHIDÆ, PYROCHROIDÆ.

- [Cf. CHAMPION (195), FAIRMAIRE (370), PIC (951, 954).]

Supplement to the Munich Catalogue, CHAMPION (195).

- Pyrochroa kabyliana*, Algeria, PIC, p. 98, Miscell. Ent. vi : ? n. sp.
Rhinosimus (Cariderus) angustirostris, Algeria, PIC, p. 35, Frelon, vi, n. sp.
Salpingus striolatus, Madagascar, FAIRMAIRE, p. 239, Ann. Soc. ent. France, 1898; *S. cribrarius*, Madagascar, FAIRMAIRE, p. 482, Ann. Soc. ent. Belgique, xlii : n. spp.

MELANDRYIDÆ.

[Cf. CHAMPION (195), SEIDLITZ (1107), SEMENOW (1111).]

Supplement to the Munich Catalogue, CHAMPION (195).

Account of the *Melandryidæ*, SEIDLITZ, Ins. Deutschl. v (2), pp. 365–680.

Abderina, n. g., in amber, cf. Palæo-entomology.

Caridina, subg. n. of *Carida*, for *triguttata* Gyll., SEIDLITZ, p. 520, Ins. Deutschl. v (2).

Eustrophinus, n. g. for part of *Eustrophus*, p. 440, with *E. axillaris*, Natal, p. 441, *bombinus*, *striatus*, Brazil, p. 442, n. spp., SEIDLITZ, t. c.

Orchesia nadeshdæ, Centr. Russia, SEMENOW, p. 289, Horæ Soc. ent. Ross. xxxii, n. sp.

Phlæotrya granicollis, Sicily, SEIDLITZ, p. 556, Ins. Deutschl. v (2), n. sp.

Synchroina, n. g., near *Synchroa*, for *S. tenuipennis*, n. sp., PERAK, FAIRMAIRE, p. 399, Ann. Soc. ent. France, lxvii.

Synstrophus, n. g. for *Eustrophus macrophthalmus*, Reitt., SEIDLITZ, p. 442, Ins. Deutschl. v (2).

Zilora sericea = (*eugeniæ* Gangl.), SEIDLITZ, p. 610, t. c.

LAGRIIDÆ.

[Cf. CHAMPION (195), FAIRMAIRE (367, 368, 369), SEIDLITZ (1107).]

Lagriidæ, account of the family, SEIDLITZ, Ins. Deutschl. v (2), pp. 306–364.

List of additions to the Munich Catalogue, CHAMPION (195).

Apteronympha, subg. n. of *Lagria*, SEIDLITZ, p. 338, Ins. Deutschl. v (2).

Chlorophila davidi, Moupin, FAIRMAIRE, p. 399, Ann. Soc. ent. France, lxvii, n. sp.

Chrysolagria, subg. n. of *Lagria*, for *C. viridipennis*, SEIDLITZ, p. 339, Ins. Deutschl. v (2).

Coracostira, n. g., p. 220, near *Nemostira*, for *C. armipes*, p. 221, *penicillata*, p. 222, n. spp., W. Africa, FAIRMAIRE, Notes Leyden Mus. xx.

Eubalia laticollis, Madagascar, FAIRMAIRE, p. 412, Ann. Soc. ent. Belgique, xlii, n. sp.

Lagria geniculata, Mongolia, p. 339, *subtilipunctata*, Amur, p. 340, SEIDLITZ, Ins. Deutschl. v (2); *L. nigriclavus*, Madagascar, FAIRMAIRE, p. 238, Ann. Soc. ent. Belgique, xlii : n. spp.

Microlagria, subg. n. of *Lagria*, for *M. poupillieri*, SEIDLITZ, p. 339, Ins. Deutschl. v (2).

ANTHICIDÆ, PEDILIDÆ, XYLOPHILIDÆ.

[Cf. CHOBOUT (204), FAIRMAIRE (362, 368, 369), PIC (946, 947, 948, 951, 957, 962, 963, 966, 968, 969, 970), SEMENOW (1112, 1113), WASMANN (1292).]

Amblyderus latipennis, Abyssinia, *sulcithorax*, Djibouti, PIC, p. 69, Bull. Mus. Paris, 1898; *A. maculipennis*, Abyssinia, PIC, p. 181, t. c. : n. spp.

Anthicus theryi, var. n. *mayeti*, *opaculus*, var. n. *mozabita*, p. 84, *sulcicollis*, var. n. *miniaticollis*, p. 85, CHOBOUT, Rev. Ent. franc. xvii.

A. ragusæ, p. 229, *subsericeus*, p. 231, Sicily, PIC, Natural. Sicil. ii; *A. spinipennis*, Algeria, *dentaticornis*, Transcaspian, PIC, p. 98, Miscell. Ent. vi; *A. transcaspicus*, p. 123, *sahlbergi*, p. 124, Turkestan, PIC, Rev. Ent. franc. xvii; *A. (Acanthinus) maculifer*, p. 142, *A. (Lappus ?) brasiliensis*, p. 143, S. America, PIC, Naturaliste, 1898; *A. elisicollis*, Somaliland, PIC, p. 510, Ann. Mus. Genova, xxxix; *A. inhumeralis*,

- p. 70, *schimperi*, A. (*Aulacoderus*) *bouvieri*, p. 71, Africa, PIC, Bull. Mus. Paris, 1898; *A. nepos*, *densatus*, *mimodromius*, Madagascar, FAIRMAIRE, p. 241, Ann. Soc. ent. Belgique, xlii; *A. albosellatus*, Madagascar, FAIRMAIRE, p. 416, *t. c.*; *A. mauritiensis*, Mauritius, PIC, p. 182, Bull. Soc. ent. France, 1898 : n. spp.
- Euglenes nadeshæ*, p. 613, *rossicus*, p. 614, Centr. Russia, SEMENOW, Horæ Soc. Ross. xxxii, n. spp.
- Eurygenius hovanus*, p. 414, *griseopubens*, p. 415, Madagascar, FAIRMAIRE, Ann. Soc. ent. Belgique, xlii, n. spp.
- Formicomus pagnoni*, Timbuctoo, PIC, p. 164, Rev. Sci. Bourbon, xi; *F. bottegoi*, Somaliland, PIC, p. 510, Ann. Mus. Genova, xxxix; *F. schimperi*, with var. *abyssinicus*, Africa, PIC, p. 68, Bull. Mus. Paris, 1898; *F. anceyi*, *filicollis*, Abyssinia, PIC, p. 63, Naturaliste, 1898; *F. fruhstorferi*, Celebes, p. 482, *wroughtoni*, *apoderinus*, p. 483, India, WASMANN, Verh. Ges. Wien, 1898 : n. spp.
- Leptaleus senegalensis*, Senegal, PIC, p. 70, Bull. Mus. Paris, 1898; *L. perrieri*, *strangulatus*, *albostrigatus*, Madagascar, FAIRMAIRE, p. 240, Ann. Soc. ent. Belgique, xlii; *L. crassitibius*, Madagascar, FAIRMAIRE, p. 415, *t. c.* : n. spp.
- Macratrìa*, catalogue, PIC, pp. 105–108, Ann. Soc. ent. Belgique, xlii.
- Mecynotarsus coronatus*, Algeria, CHOBOUT, p. 83, Rev. Ent. franc. xvii, n. sp.
- Notoxus sahlbergi*, Turkestan, PIC, p. 122, *t. c.*, n. sp.
- Pedilus xanthopus*, Siberia, SEMENOW, p. 654, Horæ Soc. Ross. xxxii, n. sp.
- Pristocyphus*, n. g., near *Mecynotarsus*, for *P. perrieri*, n. sp., Madagascar, FAIRMAIRE, Bull. Soc. ent. France, 1898, p. 37.
- Scryptia anaspina*, *acutipennis*, p. 239, *limbella*, p. 240, Madagascar, FAIRMAIRE, Ann. Soc. ent. Belgique, xlii, n. spp.
- Tomoderus sahlbergi*, Brazil, PIC, p. 141, Naturaliste, 1898, n. sp.
- Xylophilus maindroni*, Obock, PIC, p. 67, Bull. Mus. Paris, 1898; *X. alluaudi*, *mauritiensis*, Mauritius, *maculipennis*, Africa, *dilaticornis*, Madagascar, PIC, p. 68, Bull. Soc. zool. France, 1898; *X. (Elonus) crassicornis*, *X. (Zonantes?) sahlbergi*, p. 263, *brevis*, *elongatus*, p. 264, *brasiliensis*, p. 265, *X. (Ariotus?) obscurior*, *impressipennis*, p. 266, *X. (Scanylus) angulatus*, p. 267, *X. (Vanonus) gracilis*, *laticornis*, p. 268, Brazil, PIC, Ann. Soc. ent. Belgique, xlii : n. spp.

MORDELLIDÆ, RHIPIPHORIDÆ.

- [Cf. CHAMPION (195), CHOBOUT (204), REITTER (1002), SCHILSKY (1072).]
 Additions to the Munich Catalogue, *Mordellidæ*, CHAMPION (195).
 Sexual distinctions in British species of *Tomoxia*, *Mordella* and *Mordelli stena*, CHAMPION, pp. 128–130, Ent. Mag. 1898.
 Tables for determination of European *Mordellidæ*, SCHILSKY, Käf. Eur. xxxv, 35, A—SS.
Anaspis, notes on British, CHAMPION, pp. 101–103, Ent. Mag. 1898.
A. (Larisia) deserticola, Algeria, CHOBOUT, p. 85, Rev. Ent. franc. xvii;
A. konigi, Kurdistan, 87, *bohémica*, Prague, 88, *forticornis*, Austria, 89, *hispanica*, La Granja, 90, *turkmenica*, Turcomania, 92, *fausti*, Samarcand, 93, *nigriventris*, Asia Minor, 94, *sibirica*, Siberia, 97, *corcyrica*, Corfu, 98, *horni*, Pyrenees, 99, *ganglbaueri*, Dalmatia, 100, SCHILSKY, Käf. Eur. xxxv : n. spp.
Evaniocera plumicornis, Asia Minor, REITTER, p. 349, Deutsche ent. Zeitschr. 1898, n. sp.
Macrosiagon pallidipennis, Spain, REITTER, p. 350, Deutsche ent. Zeitschr. 1898, n. sp.

- Metæcus paradoxus*, oviposition, TUCK, p. 23, Ent. Rec. x.
Mordella, structure of maxillæ, CHAMPION, p. 16, Ent. Mag. 1898.
Mordellistena gemellata, S. Europe, 79, *subsquamosa*, Turcomania, 80, *championi*, Gibraltar, 82, SCHILSKY, Käf. Eur. xxxv, n. spp.
Stenalia escherichi, Anatolia, SCHILSKY, t. c. 76, n. sp.

CANTHARIDÆ, CEPHALOIDÆ.

[Cf. CASEY (189), CHOBOUT (204), FRIESE (419), PIC (954), REITTER (1002, 1003, 1005), THOMAS (1210).]

- Calydus (Calænas) escherichi*, Asia Minor, REITTER, p. 351, Deutsche ent. Zeitschr. 1898, n. sp.
Coryna somalica, Somaliland, THOMAS, p. 555, Ann. Mus. Genova, xxxix, n. sp.
Decatoma argentifera, var. n. *auberti*, CHOBOUT, p. 87, Rev. Ent. franc. xvii.
Drachylis, n. g., p. 193, *Cephaloidæ*, for *D. simulans*, n. sp., California, p. 195, CASEY, Ent. News Philad. 1898.
Hapalus (Stenoria) laterimaculatus, Mongolia, REITTER, p. 124, Wien. ent. Zeit. xvii, n. sp.
Macrobasis unicolor, habits, CHITTENDEN, p. 249, Yearb. U. S. Dep. Agric. 1898.
Meloë; on the black triungulins, WEBER, p. 213, Illustr. Zeitschr. Ent. iii.
M. saharensis, Algeria, CHOBOUT, p. 86, Rev. Ent. franc. xvii; *M. cavi-cornis*, Buchara, REITTER, p. 16, Wien. ent. Zeit. xvii : n. spp.
Mylabris distinctus, Somaliland, THOMAS, p. 555, Ann. Mus. Genova, xxxix, n. sp.
Nemognatha akbesiana, Syria, PIC, p. 35, Frelon, vi, n. sp.
Sitaris, notes on its parasitism, FRIESE, p. 97, Illustr. Zeitschr. Ent. iii.
Sponidium, n. g., *Cephaloidæ*, CASEY, p. 193, with table of species, p. 194, Ent. News Philad. 1898.
Typitium, n. g. for *Cephaloon unguare* Lec., CASEY, p. 193, t. c.
Zonabris raguseæ, Sicily, PIC, p. 217, Natural. Sicil. (2), ii, n. sp.

CEDEMERIDÆ.

[Cf. FAIRMAIRE (369), LINELL (788), PIC (961), REITTER (1018), SEMENOW (1117), WICKHAM (1325).]

- The *Oedemeridæ* and *Cephaloidæ* of Canada, WICKHAM, pp. 149–152, Canad. Ent. xxx.
Ananca attenuata, Madagascar, FAIRMAIRE, p. 416, Ann. Soc. ent. Belgique, xlii, n. sp.
Anoncodes signaticollis, Syria, PIC, p. 92, Rev. Sci. Bourbon, xi, n. sp.
Asclera tenuecostata, Madagascar, FAIRMAIRE, p. 416, Ann. Soc. ent. Belgique, xlii, n. sp.
Asclera, table of species, REITTER (1018); *A. deyrollei*, var. *milleri*, PIC, p. 38, Frelon, vi.
A. nigripennis, Turkestan, *fulvicollis*, Syria, *nigrina*, *basicornis*, Greece, REITTER (1018) : n. spp.
Homomorpha, n. g. for *H. crucifera*, n. sp., Chinese Turkestan, SEMENOW, Wien. ent. Zeit. xvii, p. 177.
Oschaninia, n. g. for *Ganglbaueria wilkinsi* Heyd., SEMENOW, p. 175, Wien. ent. Zeit. xvii.
Oxacis galapagoensis, Chatham island, LINELL, p. 266, P. U. S. Mus. xxi, n. sp.

CURCULIONIDÆ.

[The following titles refer to *Curculionidæ*, viz. :—ABEILLE (2), APFELBECK (24), DESBROCHERS (292-294, 296), ECKSTEIN (340), FAIRMAIRE (360, 362, 368, 369, 370), FALL (371), FAUST (373-378), FORMANEK (404), FROGGATT (422), GERLACH (449), HELLER (532), HUTTON (588), KOLBE (689, 692), LESNE (773), LINELL (788), MACDOUGALL (803, 804), MAYET (835), MÜLLER (881), PIC (954, 957, 966), REITTER (1002, 1004, 1005), SCHULTZE (1086-1089), SLINGERLAND (1144).]

Curculionidæ injurious in N. S. W., FROGGATT (422).

Acalles moraguesi, Palma, DESBROCHERS, p. 45, Frelon, vi; *A. fougeri*, Chatham islands, HUTTON, p. 157, Tr. N. Zealand Inst. xxx : n. spp.

Acicnemis (*Berethia*?) *præambulus*, E. India, FAUST, p. 313, Deutsche ent. Zeitschr. 1898, n. sp.

Aclees hovanus, Madagascar, FAIRMAIRE, p. 242, Ann. Soc. ent. Belgique, xlii, n. sp.

Adorhabdotus delta, Cameroons, FAUST, p. 21, Deutsche ent. Zeitschr. 1898, n. sp.

Alcides cylindricus, p. 263, *amitinus*, *comma*, p. 264, *denticulatus*, *cribri-thorax*, p. 265, *deremius*, p. 266, Africa, KOLBE, Arch. Naturges. lxiv; *A. vafellus*, *mellitus*, p. 308, *discrepans*, p. 309, *acutus*, p. 310, E. India, FAUST, Deutsche ent. Zeitschr. 1898 : n. spp.

Allodactylus pulvillus, Sicily, SCHULTZE, p. 255, Abeille, xxix, n. sp.

Alsirhinus, n. g., near *Camptorhinus*, p. 245, for *A. lineolatus*, n. sp., Madagascar, p. 246, FAIRMAIRE, Ann. Soc. ent. Belgique, xlii.

Amorphoidea pilosa, E. India, FAUST, p. 302, Deutsche ent. Zeitschr. 1898, n. sp.

Amphionotus, n. g., type *Geonemus douei* Montr., FAUST, p. 237, Ent. Zeit. Stettin, lviii.

Amphitmetus, n. g., p. 251, *Oosominae*, for *Diatmetus transversus* K., KOLBE, Arch. Naturges. lxiv.

Anaballus? *turbatus*, p. 183, *uniformis*, p. 184, Aru islds., FAUST, Ent. Zeit. Stettin, lix, n. spp.

Anathymus meyeri, p. 207, *coloratus*, p. 208, Java, FAUST, t. c., n. spp.

Aphyocnemus, n. g., Type *Menemachus stigma* Pasc., "Cotypes" *Hoplitopales melaspis* and *nothus* Faust, FAUST, p. 50, Deutsche ent. Zeitschr. 1898.

Apion apricans, habits, larva, LAMPA, p. 22, cut, Ent. Tidskr. xix : A. : revision of the North American, 108 species half of them new, FALL, Tr. Amer. Ent. Soc. xxv, pp. 105-184, pls. ii-v.

A. cariosum, Madagascar, FAIRMAIRE, p. 488, Ann. Soc. ent. Belgique, xlii; *A. kuenburgi*, Buchara, REITTER, p. 125, Wien. ent. Zeit. xvii; *A. credulum*, *insolens*, p. 287, *grus*, p. 288, *tonsile*, p. 289, *morosum*, *majorinum*, p. 290, *semotum*, p. 291, E. India, FAUST, Deutsche ent. Zeitschr. 1898; *A. impeditum*, *quadricolle*, p. 113, *coracellum*, *anceps*, p. 115, *finitimum*, p. 116, *virile*, p. 117, *sinuirostre*, *molestum*, p. 121, *funereum*, *occidentale*, p. 123, *hesperum*, p. 124, *reclusum*, p. 126, *curticorne*, p. 127, *tenuiforme*, *acrophilum*, p. 129, *coxale*, p. 134, *impexum*, p. 136, *propinquicorne*, *subtinctum*, p. 138, *pervicax*, p. 139, *gulare*, p. 140, *chuparosa*, *grossulum*, p. 141, *perforicolle*, *novellum*, p. 144, *nebraskense*, p. 145, *importunum*, p. 146, *aquabile*, *dolosum*, *carinirostrum*, p. 148, *peninsulare*, p. 149, *centrale*, p. 151, *coloradense*, p. 152, *furtivum*, *commodum*, p. 154, *auripes*, p. 157, *huron*, p. 159, *alternatum*, p. 160, *nasutum*, p. 161, *arizonæ*, *fumitarse*, p. 162, *filum*, p. 163, *subornatum*, p. 164, *crassum*, p. 165, *decoloratum*, *emaciipes*, p. 166, *elutipes*, p. 167, *solutum*, p. 168, *disparipes*, *spinipes*, p. 169, *graciliforme*, p. 170, *aculeatum*, p. 171,

- persimile fibulipes*, p. 172, *puritanum*, *umboniferum*, p. 174, *xanthoxyli*, p. 176, N. America, FALL, Tr. Amer. ent. Soc. xxv : n. spp.
- Apoderus discrepans*, p. 274, *usambicus*, *arboretum*, p. 275, *panganicus*, *spinidorsis*, p. 276, Africa, KOLBE, Arch. Naturges. lxiv ; *A. conradti*, p. 24, *semipallens*, p. 25, *vitreus*, p. 26, Cameroons, FAUST, Deutsche ent. Zeitschr. 1898 ; *A. bistriolatus* with var. *seclusus*, *picinus*, *A. (Centrocorynus) flavotorosus*, E. India, FAUST, t. c., p. 296, n. spp.
- Apotomorhampus*, n. g., *Celeuthetides*, near *Trigonops*, for *A. splendens*, p. 264, *sarasini*, p. 265, n. spp., Celebes, FAUST, Ent. Zeit. Stettin, lviii.
- Arachnopus fenestratus*, var. n. *demissus*, FAUST, p. 192, Ent. Zeit. Stettin, lix.
- A. prævius*, p. 189, *imitator*, p. 190, *olivieri*, *disparilis*, p. 191, *lacerta*, p. 192, *anthonyi*, p. 194, New Guinea, FAUST, t. c., n. spp.
- Asyteta*, characters, table of species, FAUST, pp. 161–166, t. c.
- A. versuta*, p. 166, *sejuncta*, p. 167, New Guinea, *aucta*, Ighibirei, p. 168, *verecunda*, New Guinea, p. 169, *propinqua*, Fergusson isld., p. 170, *dorsalis*, New Guinea, p. 170, *signata*, Fergusson isld., p. 171, *definita*, Halmaheira, p. 172, *brevipennis*, Mailu, p. 173, *dubia*, hab. ?, p. 174, FAUST, t. c., n. spp.
- Atactus*, n. g. for *Celeuthetes deplanatus* Boh., FAUST, p. 260, Ent. Zeit. Stettin, lviii.
- Athesapeuta immaculata*, p. 327, *soror*, p. 328, *affinis*, p. 329, E. India, FAUST, Deutsche ent. Zeitschr. 1898, n. spp.
- Attelabus rubrodorsatus*, p. 491, *perrieri*, *asperipennis*, p. 492, Madagascar, FAIRMAIRE, Ann. Soc. ent. Belgique, xlii, n. spp.
- Auletobius longicollis*, E. India, FAUST, p. 299, Deutsche ent. Zeitschr. 1898, n. sp.
- Bagous lutosus* and *glabrirostris*, characters, CHAMPION, p. 53, Ent. Mag. 1898.
- B. impressus*, Madagascar, FAIRMAIRE, p. 246, Ann. Soc. ent. Belgique, xlii, n. sp.
- Balaninus simus*, *rufipes*, p. 300, *lepidus*, p. 301, E. India, FAUST, Deutsche ent. Zeitschr. 1898, n. spp.
- Balanogastris*, n. g., pp. 52 and 70, *Isorhynchina*, Type *Balaninus kolæ* Desbr., and including, *B. austerus*, p. 70, *plausibilis*, p. 71, *honestus*, p. 72, n. spp., Cameroons, FAUST, t. c.
- B. kolæ*, noticed, LESNE & MARTIN, p. 280, Bull. Soc. ent. France, 1898. Full description of larva and pupa of *B. kolæ*, LESNE, Bull. Mus. Paris, 1898, pp. 140–147.
- Baridius albus*, Algeria, ABEILLE, p. 257, Bull. Soc. ent. France, 1898 ; *B. subcylindricus*, E. India, FAUST, p. 326, Deutsche ent. Zeitschr. 1898 : n. spp.
- Baris x-album*, *sæva*, E. India, FAUST, p. 325, t. c., n. spp.
- Barynotus maculatus*, and *margaritaceus*, distinctions, STIERLIN, p. 139, Mt. Schweiz. ent. Ges. x.
- Bastaphorus*, n. g., p. 490, near *Sphenophorus*, for *B. perrieri*, n. sp., Madagascar, p. 491, FAIRMAIRE, Ann. Soc. ent. Belgique, xlii.
- Behrensiellus*, n. n. for *Cataphractus* Behr. nec STORR, BERG, p. 17, Com. Mus. Buenos Aires, i.
- Brachycerus puerilis*, p. 240, *accola*, p. 241, *polymastulus*, *uvula*, p. 242, *parcus*, *comparabilis*, *salamensis*, p. 243, *sulcaticeps*, *fischeri*, p. 244, E. Africa, KOLBE, Arch. Naturges. lxiv, n. spp.
- Brachytemnus cephalotes*, E. India, FAUST, p. 333, Deutsche ent. Zeitschr. 1898, n. sp.
- Bradybatus kellneri tomentosus* var. n., REITTER, pp. 355, 356, t. c.
- B. (Nothops) ornatooides*, Beirut, REITTER, p. 354, t. c., n. sp.
- Bryochæta interrupta*, *quadrifasciata*, FAUST, p. 20, Deutsche ent. Zeitschr. 1898, n. spp.

- Calandra longuiscula*, Madagascar, FAIRMAIRE, p. 490, Ann. Soc. ent. Belgique, xlii, n. sp.
- Camia semiopaca*, New Guinea, FAUST, p. 205, Ent. Zeit. Stettin, lix, n. sp.
- Camptorhamphus*, n. g., *Academini*, for *C. dorsalis*, n. sp., Cameroons, FAUST, Deutsche ent. Zeitschr. 1898, p. 32.
- Camptorhinus asperatus*, referred to *Megamastus*, FAIRMAIRE, p. 418, Ann. Soc. ent. Belgique, xlii.
- Caulosomus*, n. g., p. 88, *Stromboscerini*, for *C. sulcicollis*, n. sp., Cameroons, p. 89, FAUST, Deutsche ent. Zeitschr. 1898.
- Celebia validicornis*, Celebes, HELLER, p. 31, pl. iii, fig. 15, Abh. Mus. Dresden, vii, No. 3, n. sp.
- Celeuthetes hebridarum*, New Hebrides, *boisduvali*=(*australis* Boisd.), p. 262, *granulosus*, p. 263, New Guinea, FAUST, Ent. Zeit. Stettin, lviii.
- Celeuthetides*, table of the genera, FAUST, pp. 230–237, *t. c.*
- Ceuthorrhynchini*, synonymy resulting from the examination of numerous types, SCHULTZE, pp. 161–168, Deutsche ent. Zeitschr. 1898, also *t. c.* pp. 264–270.
- Ceuthorrhynchus similis* and *parvulus*, characters, p. 261, *marginatus*=(*distinctus*), p. 263, *antennalis*, noticed, p. 263, SCHULTZE, *t. c.*
- C. mendax*, Araxes Valley, p. 234, *horni*, Tunis, p. 235, *littoralis*, Dalmatia, p. 236, *difficilis*, Angora, p. 237, *erivanus*, Eriwan, p. 238, *curvirostris*, Vienna, *transcaspicus*, Merv, p. 240, *hirsutulus*, Margelan, p. 242, *plumbellus*, Siebenbürgen, p. 243, *pollicaris*, Austria, p. 244, *C. (Thamiocolus altaicus*, Altai, p. 246, *C. smyrnensis*, Smyrna, p. 248, *polystriatus*, p. 249, *weisei*, p. 250, Caucasus, *levantinus*, Asia Minor, p. 251, *nitidipennis*, Araxes Valley, *picipennis*, Algeria, p. 253, *svaneticus*, Swanetia, p. 255, *liliputanus*, Hungary, p. 256, *granifer*, Algeria, p. 257, *changaicus*, Mongolia, p. 258, *globoicollis*, Afghanistan, p. 260, SCHULTZE, Deutsche ent. Zeitschr. 1898; *C. squamifer*, p. 256, *biskrensis*, p. 257, *scolopax*, *vaulogeri*, p. 258, *tessellatus*, p. 259, Algeria, *pardalis*, Sicily, p. 260, *scobinatus*, Tunis, p. 261, *maurus*, Algeria, p. 262, *capillatus*, Tunis, p. 263, *tarsatus*, Algeria, p. 264, *punicus*, Tunis, *africanus*, p. 265, *incisus*, Algeria, p. 266, *sparsutus*, S.E. Europe, p. 267, SCHULTZE, Abeille, xxix; *C. (Thamiocolus) altaicus*, Altai, p. 254, *C. levantinus*, Asia Minor, p. 256, SCHULTZE, Termes. Fuzetek, xxi; *C. asperulus*, E. India, FAUST, p. 323, Deutsche ent. Zeitschr. 1898 : n. spp.
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Cormopus penicillifer, ♀, SENNA, p. 369, *t. c.*

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Epitaphius, n. g., aberrant, for *E. nigropictus*, p. 493, *annulicornis*, p. 494, n. spp., Madagascar, FAIRMAIRE, *t. c.*
Eugigas nubilus, Borneo, JORDAN, p. 359, Nov. Zool. v, n. sp.
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Litocerus forticornis, *puncticollis*, Macassar, JORDAN, p. 365, *t. c.*, n. spp.
Mecotropis cinerascens, Malacca, *similis*, Java, p. 359, *cælestis*, *samarensis*, p. 360, *whiteheadi*, p. 361, Samar, JORDAN, *t. c.*, n. spp.
Nessiara macassarensis, Macassar, JORDAN, p. 365, *t. c.*, n. sp.
Nistacares, n. g., near *Caranistes*, for *N. leucostictus*, n. sp., Madagascar, FAIRMAIRE, p. 419, Ann. Soc. ent. Belgique, xlii.
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CERAMBYCIDÆ.

[Cf. BERG (68), DISTANT (301), EMMEREZ (348), FAIRMAIRE (368, 369, 370), GAHAN (439, 497), GESTRO (457), GRANDIS & MUZIO (479), HELLER (532), HUTTON (588), JORDAN (626), LAUFFER (752), PIC (948, 955, 956, 962, 965), REITTER (1002, 1004, 1005, 1011, 1013), RITSEMA (1032, 1033), ROSENBERG (1041), SEMENOW (1113, 1114), WATERHOUSE (1307).]

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- Madecops denticollis*, Bourbon, FAIRMAIRE, p. 495, Ann. Soc. ent. Belgique, xlii, n. sp.
- Mallosia caucasica*, Caucasus, PIC, p. 168, Bull. Soc. ent. France, 1898, n. sp.
- Margites lineatus*, East Africa, GAHAN, p. 41, Ann. Nat. Hist. (vii) ii, n. sp.
- Monohammus hollisii*, Usambara, WATERHOUSE, p. 262, *t. c.*, n. sp.
- Nemophas rosenbergi* and *tricolor*, distinguished, HELLER, p. 36, Abh. Mus. Dresden, vii, No. 3.
- N. websteri*, New Hanover, *cyanescens*, Kei Toeal, JORDAN, p. 419, Nov. Zool. v, n. spp.
- Neodorcadion katharinae*, Mongolia, REITTER, p. 21, Wien. ent. Zeit. xvii, n. sp.
- Oberea kassneri*, Transvaal, DISTANT, p. 378, Ann. Nat. Hist. (vii) i, n. sp.
- Olenecamptus tessellata*, Delagoa Bay, DISTANT, p. 384, *t. c.*, n. sp.
- Oxyprosopus junodi*, Delagoa Bay, DISTANT, p. 380, *t. c.*, n. sp.

- Palimna mimica*, Boutang, FAIRMAIRE, p. 399, Ann. Soc. ent. France, lxvii, n. sp.
- Paralocus*, n. g., near *Anisogaster*, for *P. semitibialis*, n. sp., Madagascar, FAIRMAIRE, p. 252, Ann. Soc. ent. Belgique, xlii.
- Paridactus*, n. g., near *Idactus*, for *P. tarsalis*, n. sp., E. Africa, GAHAN, p. 47, Ann. Nat. Hist. (vii) ii.
- Pelagoderus nigroplagiatus*, Malay Arch., RITSEMA, p. 33, Notes Leyden Mus. xx, n. sp.
- Phytæcia kurdistanæ* var. n. *korbi*, PIC, p. 334, Bull. Soc. ent. France, 1898; *P. prætextata*, var. n. *implagiata*, REITTER, p. 126, Wien. ent. Zeit. xvii.
- P. edessensis*, Akbès, REITTER, p. 358, Deutsche ent. Zeitschr. 1898, n. sp.
- Pixodarus*, defined, GAHAN, p. 368, Ann. Nat. Hist. (vii) i; *P. nyassæ*, re-described, DISTANT, *t. c.*, p. 378.
- P. pretorius*, Transvaal, DISTANT, p. 368, *t. c.*, n. sp.
- Plectropygus*, n. g., *Hecyridides*, p. 54, for *P. mucoreus*, p. 55, n. sp., E. Africa, GAHAN, Ann. Nat. Hist. (vii) ii.
- Plocoderus peeleei*, E. Africa, GAHAN, p. 42, *t. c.*, n. sp.
- Pæcilopeplus martialis*, Costa Rica, *flavescens*, Ecuador, ROSENBERG, p. 92, Nov. Zool. v, n. spp.
- Polyarthron faurebigueti*, Timbuctoo, PIC, p. 165, Rev. Sci. Bourbon. xi, n. sp.
- Prionus jakowlewi*, n. n. for *asiaticus* Jak. nec Fald., SEMENOW, p. 105, Bull. Soc. Moscou, 1898.
- Prosopocera falcata*, Transvaal, DISTANT, p. 373, Ann. Nat. Hist. (vii) i; *P. marmorata*, E. Africa, GAHAN, p. 48, *op. cit.* (vii) ii; *P. uniformis*, Usambara, WATERHOUSE, p. 263, *t. c.* : n. spp.
- Protomocerus*, n. g., p. 48, *Prosopocerides*, for *P. gregorii*, p. 49, *socius*, p. 50, Trop. Africa, n. spp., GAHAN, *t. c.*
- Psathyrus modestus*, p. 374, *lineatus*, p. 375, Transvaal, DISTANT, Ann. Nat. Hist. (vii) i, n. spp.
- Rhagiops*, n. g., near *Musius*, for *R. costulipennis*, n. sp., Madagascar, FAIRMAIRE, p. 249, Ann. Soc. ent. Belgique, xlii.
- Rhagium fortipes*, Akbès, *rugipennis*, Irkutsk, REITTER, p. 357, Deutsche ent. Zeitschr. 1898, n. spp.
- Scolecobrotus westwoodii*, habits, BEST, p. 146, Victorian Natural. xiv.
- Semiclinia*, n. g., near *Clinia*, p. 254, *S. denseguttata*, n. sp., Madagascar, FAIRMAIRE, Ann. Soc. ent. Belgique, xlii.
- Sophronica bettoni*, p. 58, *testacea*, p. 59, E. Africa, GAHAN, Ann. Nat. Hist. (vii) ii, n. spp.
- Stathmodera grandis*, Usambara, WATERHOUSE, p. 264, *t. c.*, n. sp.
- Strangalia limbiventris*, Caucasus, REITTER, p. 21, Wien. ent. Zeit. xvii, n. sp.
- Syndere apicalis*, E. Africa, GAHAN, p. 44, Ann. Nat. Hist. (vii) ii, n. sp.
- Tetraglenes pienaari*, Transvaal, DISTANT, p. 378, Ann. Nat. Hist. (vii) i, n. sp.
- Tragiscoschema amicta*, Delagoa Bay, DISTANT, p. 383, *t. c.*; *T. ornata*, E. Africa, GAHAN, p. 52, *t. c.* (vii) ii, n. sp.
- Tragocephala mashenga*, Delagoa Bay, DISTANT, p. 382, Ann. Nat. Hist. (vii) i, n. sp.
- Xystrocera ansorgei*, Uganda, GAHAN, p. 40, *op. cit.* (vii) ii, n. sp.
- Zamium bicolor*, Transvaal, DISTANT, p. 369, *op. cit.* (vii) i, n. sp.
- Zarina*, n. g., near *Sisyrium*, for *Z. semicyanea*, n. sp., Madagascar, FAIRMAIRE, p. 251, Ann. Soc. ent. Belgique, xlii.
- Zonotylus*, n. g., near *Zonopterus*, for *Cerambyx interruptus*, OL., GAHAN, p. 9, pl. fig. 6, Tr. R. Soc. Edinburgh, xxxix.

BRUCHIDÆ.

[Cf. CHITTENDEN (203), FAIRMAIRE (368), PIC (960, 964).]

Bruchus obtectus, *pisi*, *chinensis*, *quadrimaculatus*, natural history, with illustrations, CHITTENDEN, pp. 234–248, Yearb. U. S. Dep. Agric. 1898.

B. (Pachymerus) humerosus, *B. conicicollis*, Madagascar, FAIRMAIRE, p. 247, Ann. Soc. ent. Belgique, xlii, n. sp.

Caryoborus martini, Madagascar, *albonotatus*, Natal, PIC, p. 371, Bull. Soc. ent. France, 1898, n. spp.

Caryopemon luteonotatus, India, p. 173, *longipennis*, Soudan, p. 174, PIC, Bull. Soc. zool. France, 1898, n. spp.

Spermophagus pectoralis, habits, figure, CHITTENDEN, p. 248, Yearb. U. S. Dep. Agric. 1898; *S. variolosopunctatus*, var. n., *albipilis*, CHOBOUT, p. 87, Rev. Ent. franc. xvii.

CHRYSOMELIDÆ.

[Cf. BEDEL (60), BLACKBURN (100), CHOBOUT (206), FAIRMAIRE (361, 362, 368, 369, 370), GESTRO (450, 451, 452, 454), HELLER (532), JACOBSON (595), JACOBY (596 to 604), KOLBE (694), LÉCAILLON (756 to 758), LINELL (787), LOWE (795), PÉRINGUEY (939), PIC (953, 958, 961), REITTER (1005), ROSENBERG (1041), SLINGERLAND (1145), SPAETH (1166, 1167), WEISE (1314), ZEHNTNER (1340).]

Egg-envelopes, epichorion, LÉCAILLON (756, 758).

Embryology of *Chrysomelidæ*, LÉCAILLON (757).

Acolastus nigroplagiatus, pl. xxii, fig. 4, p. 224, *tuberculatus*, p. 225, S. Africa, JACOBY, P. Zool. Soc. London, 1898, n. spp.

Acrocrypta viridipennis, Borneo, JACOBY, p. 378, Ann. Soc. ent. Belgique, xlii, n. sp.

Adoxus, synonymical note, p. 189, male characters, varr. n. *lewisi*, *concinus*, p. 190, WEISE, Arch. Naturges. lxiv.

Ænidea imitans, Transvaal, JACOBY, p. 357, Ann. Nat. Hist. (vii) i, n. sp.

Ætheomorpha cærulea, Mashonaland, JACOBY, p. 221, pl. xxii, fig. 8, P. Zool. Soc. London, 1898, n. spp.

Agelacida, n. g., *Monoleptinæ*, p. 358, for *A. marginata*, n. sp., Pretoria, p. 359, JACOBY, Ann. Nat. Hist. (vii) i.

Alittus foveolatus = (*Terillus micans*), BLACKBURN, p. 232, Tr. Soc. S. Austral. xxii.

Alurnus costalis, p. 93, *humeralis*, Ecuador, *boucardi*, Colombia, p. 94, *sexguttatus*, Ecuador, p. 95, ROSENBERG, Nov. Zool. v, n. spp.

Amblispa australis, Salisbury, PÉRINGUEY, p. 114, Ann. S. African Mus. i, n. sp.

Anisognatha quadriplagiata, Natal, JACOBY, p. 220, pl. xxii, fig. 6, P. Zool. Soc. London, 1898, n. sp.

Antipha fulvofrontalis, Nias island, JACOBY, p. 626, Ann. Mus. Genova, xxxix, n. sp.

Antipus fulveola, Transvaal, JACOBY, p. 348, Ann. Nat. Hist. (vii) i, n. sp.

Antsianaka latesuturata, p. 255, *prasinella*, p. 256, Madagascar, FAIRMAIRE, Ann. Soc. ent. Belgique, xlii, n. spp.

Arsipoda blackburni, N. S. Wales, JACOBY, p. 375, Ann. Soc. ent. Belgique, xlii, n. sp.

Aspidispa signaticollis, New Guinea, GESTRO, p. 258, Termes. Fuzetek, xxi, n. sp.

Aspidomorpha punctum F. = (*badeni* Wag.), SPAETH, p. 278, Verh. Ges. Wien, 1898; *A. turrigera* referred to *Sindia*, *A. bonnyana* = (*bennigseni* Weise), SPAETH, p. 540, Verh. Ges. Wien, 1898.

- A. picta*, *bennigseni*, p. 219, *lata*, *irrorata*, p. 220, Africa, WEISE, Arch. Naturges. lxiv; *A. plasoni*, New South Wales, SPAETH, p. 539, Verh. Ges. Wien, 1898 : n. spp.
- Atechna interruptofasciata*, Natal, JACOBY, p. 241, pl. xxii, fig. 11, P. Zool. Soc. London, 1898, n. sp.
- Augomela ignita*, N. S. Wales, JACOBY, p. 368, Ann. Soc. ent. Belgique, xlii, n. sp.
- Aulacophora abdominalis*=(*palmerstoni*), BLACKBURN, p. 233, Tr. Soc. S. Austral. xxii.
- Balyana*, n. g., near *Cælenomenodera* for *B. algoensis*, n. sp., Mozambique, PÉRINGUEY, p. 115, Ann. S. African Mus. i.
- Balyana* (sub *Cælenomenodera*) *sculptilis* Fairm.=(*algoensis* Pér.) and is not from Madagascar, DONCKIER, p. 362, Bull. Soc. ent. France, 1898.
- Bia lanuginosa* Boh., var.=(*pubescens* Boh.), SPAETH, p. 273, Verh. Ges. Wien, 1898.
- Brachyruca*, n. g., p. 257, *Aulacophorites*, for *B. apicicornis*, n. sp., Madagascar, p. 258, FAIRMAIRE, Ann. Soc. ent. Belgique, xlii.
- Cassida morata* Boh., and *Aspidomorpha confinis* Klug., distinguished, SPAETH, p. 278, Verh. Ges. Wien, 1898; *C. externeguttata* Fairm., and *bonnyana* Gorh., referred to *Aspidomorpha*, *id.*, l. c.
- C. lurida* Boh. referred to *Aspidomorpha*, *id.*, p. 540, t. c.
- C. irrorata*, *marginata*, *C. (Odontionycha) usambarica*, p. 221, *kraatzi*, *pauli*, p. 222, Africa, WEISE, Arch. Naturges. lxiv; *C. cepæcolor*, Madagascar, FAIRMAIRE, p. 498, Ann. Soc. ent. Belgique, xlii : n. spp.
- Cephalodonta balyi*, n. n. for *maculata* Baly, GRIMSHAW, p. 10, Tr. R. Soc. Edinburgh, xxxix.
- Cerotoma trifurcata*, habits, metamorphosis, CHITTENDEN, p. 253, cuts, Yearb. U. S. Dep. Agric. 1898.
- Chaetocnema varicolor*, Somaliland, JACOBY, p. 530, Ann. Mus. Genova, xxxix, n. sp.
- Chalcomela variegata*, N. S. Wales, JACOBY, p. 367, Ann. Soc. ent. Belgique, xlii, n. sp.
- Charidotis herminæ*, Brazil, SPAETH, p. 278, Verh. Ges. Wien, 1898, n. sp.
- Cheiridisia*, n. g., near *Cheiridea*, for *C. inornata*, n. sp., Mashonaland, pl. xxii, fig. 10, JACOBY, p. 226, P. Zool. Soc. London, 1898.
- Chelymorpha notata* Boh., referred to *Cistudinella*, SPAETH, p. 277, Verh. Ges. Wien, 1898.
- Chirida lactifica* Boh.=(*insignis* W.), WEISE, p. 223, Arch. Naturges. lxiv.
- Chlamys arizonensis*, N. America, LINELL, p. 479, P. U. S. Mus. xx, n. sp.
- Chloropterus pallidus*, Sahara, CHOBOUT, p. 208, Bull. Soc. ent. France, 1898, n. sp.
- Chrysodina alutacea*, *cupricollis*, *paraguayensis*, p. 163, *peruana*, p. 164, S. America, JACOBY, Entomologist, 1898, n. spp.
- Chrysomela*, criticism and corrections of de Marseul's work, pp. 192–202, *C. lichenis*, variation, p. 203, WEISE, Arch. Naturges. lxiv; *C. polita* var. n. *kafkana*, REITTER, p. 359, Deutsche ent. Zeitschr. 1898.
- C. carpathica*, p. 205, Europe, *solida*, Korea, *C. (Polysticta) 12-stillata*, p. 207, Usambara, WEISE, Arch. Naturges. lxiv; *C. compuncta*, Syria, WEISE, p. 191, t. c.; *C. nikolskyi*, E. Siberia, p. 200, *platyscelidina*, Dshungaria, p. 201, JACOBSON, Annuaire Mus. St Petersburg. 1898; *C. africana*, Natal, JACOBY, p. 241, P. Zool. Soc. London, 1898 : n. spp.
- Chrysopina subglabrata*, Philippines, JACOBY, p. 354, Ann. Soc. ent. Belgique, xlii, n. sp.
- Cleoporus ribbei*, Salomon Islands, JACOBY, p. 365, t. c., n. sp.
- Cleorina philippinensis*, Philippines, JACOBY, p. 364, t. c., n. sp.
- Clytra cingulata*, Kurdistan, *puberula*, Spain, p. 181, *arida*, N. E. Asia, p. 182, WEISE, Arch. Naturges. lxiv; *C. opaca*, Bukhara, JACOBSON,

- p. 191, Annuaire Mus. St Petersburg. 1898; *C. suturata*, Bengal, JACOBY, p. 185, Ann. Soc. ent. Belgique, xlii; *C. impressicollis*, Transvaal, JACOBY, p. 346, Ann. Nat. Hist. (vii) i : n. spp.
- Coccimela*, n. g., near *Centroscelis*, for *C. fulgida*, n. sp., Usambara, WEISE, p. 209, Arch. Naturges. lxiv.
- Cœlanomenodera perrieri*, Madagascar, FAIRMAIRE, p. 498, Ann. Soc. ent. Belgique, xlii, n. sp.
- Cœnobius pulcher*, *externus*, p. 215, *variabilis*, p. 216, Africa, WEISE, Arch. Naturges. lxiv, n. spp.
- Colaspidea arachnoides*, referred to *Pausiris*, JACOBY, p. 232, P. Zool. Soc. London, 1898.
- Colaspoides brevicollis*, p. 361, *borneoensis*, Borneo, *fruhstorferi*, hab. ?, p. 362, *angusticollis*, Borneo, p. 363, JACOBY, Ann. Soc. ent. Belgique, xlii, n. spp.
- Colasposoma fulgidum*, *scutellare*, characters, JACOBY, pp. 352, 353, Ann. Nat. Hist. (vii) i; *C. bottegi*, Somaliland, JACOBY, p. 524, Ann. Mus. Genova, xxxix; *C. semihirsutum*, p. 232, *marshalli*, *plumbeum*, p. 233, *pubipennis*, p. 234, S. Africa, JACOBY, P. Zool. Soc. London, 1898 : n. spp.
- Coptocephala gebleri* and *unifasciata*, distinguished, WEISE, p. 183, Arch. Naturges. lxiv.
- Corynodes discoidalis*, Sumatra, JACOBY, p. 364, Ann. Soc. ent. Belgique, xlii, n. sp.
- Crepidodera carinata*, N. Carolina, LINELL, p. 484, P. U. S. Mus. xx, n. sp.
- Crioceris asparagi*, 12-*punctata*, life-histories, SMITH, Report, 1898, pp. 456-464.
- C. theana*, East Siberia, REITTER, p. 22, Wien. ent. Zeit. xvii; *C. elongata*, Mashonaland, JACOBY, p. 215, P. Zool. Soc. London, 1898; *C. multi-maculata*, Bengal, JACOBY, p. 185, Ann. Soc. ent. Belgique, xlii : n. spp.
- Crosita kowalewskyi* var. n. *cupreoviridula*, *C. matronula* var. n. *viridula*, JACOBSON, p. 198, Annuaire Mus. St Petersburg. 1898.
- C. alaschanica*, p. 196, *przewalskyi*, Mongolia, *longipes*, p. 197, E. Siberia, JACOBSON, t. c., n. spp.
- Cryptocephalus*, synonymy of European, BEDEL, p. 267, Abeille, xxix; *C. africanus*=(*unicinctus* Jac.), *C. angustofasciatus*=(*bimaculicollis* Jac.), JACOBY, p. 225, P. Zool. Soc. London, 1898; *C. mannerheimi* var. n. *ussuriensis*, p. 184, *C. vittatus* var. n. *optatus*, p. 185, *pallifrons* var. n. *epipleuralis*, *quadriguttatus* var. n. *nuntius*, p. 189, *C. villosulus* and allies, characters, pp. 187, 188, WEISE, Arch. Naturges. lxiv; *C. ocellatus* var. n. *nigrifrons*, BEDEL, p. 243, Faune Seine, Coléoptères; *C. sanguinolentus*, hab. truly Africa and India, JACOBY, p. 186, Ann. Soc. ent. Belgique, xlii.
- C. delagrangi*, Syria, PIC, p. 93, Rev. Sci. Bourbon, xi; *C. agnus*, *micro-pyga*, Mongolia, p. 184, *araxidis*, Araxes Valley, p. 186, WEISE, Arch. Naturges. lxiv; *C. prosdocetus*, Turkestan, p. 192, *transcaucasicus*, p. 193, Transcaucasus, JACOBSON, Annuaire Mus. St Petersburg. 1898; *C. pauli*, p. 217, *usambaricus*, p. 218, Africa, WEISE, Arch. Naturges. lxiv; *C. nigrofrontalis*, *epipleuralis*, pl. xxii, fig. 3, Natal, JACOBY, p. 223, P. Zool. Soc. London, 1898; *C. sacchii*, Somaliland, JACOBY, p. 523, Ann. Mus. Genova, xxxix; *C. distantii*, Transvaal, JACOBY, p. 344, Ann. Nat. Hist. (vii) i; *C. marianus*, Madagascar, FAIRMAIRE, p. 38, Bull. Soc. ent. France, 1898; *C. fractiscriptus*, *crenulicollis*, p. 425, *sulcipennis*, *breviscutatus*, p. 426, *latecinctus*, *eburneopictus*, p. 427, Madagascar, FAIRMAIRE, Ann. Soc. ent. Belgique, xlii; *C. sternalis*, *obscuripes*, Madagascar, FAIRMAIRE, p. 497, Ann. Soc. ent. Belgique, xlii; *C. pubicollis*, Arizona, LINELL, p. 480, P. U. S. Mus. xx : n. spp.
- Cryptonychus extremus*, Natal, PÉRINGUEY, p. 114, Ann. S. African Mus. i, n. sp.

- Damia mashonana*, Salisbury, JACOBY, p. 217, P. Zool. Soc. London, 1898, n. sp.
- Dasychlorus*, n. g., p. 19, *Eumolpides* near *Sybriacus*, for *D. passeti*, n. sp., W. Africa, p. 20, FAIREMAIRE, Bull. Soc. ent. France, 1898.
- Dasychlorus variicolor*, Gaboon, FAIRMAIRE, p. 222, Notes Leyden Mus. xx, n. sp.
- Dermestops*, n. g., *Heteraspites*, for *D. ahngeri*, Transcaspian, n. sp., JACOBSON, p. 195, Annuaire Mus. St. Petersb. 1898.
- Deuterocampta opaca*, p. 164, *irregularis*, p. 165, S. America, JACOBY, Entomologist, 1898, n. spp.
- Diabrotica nitida*, Texas, LINELL, p. 483, P. U. S. Mus. xx, n. sp.
- Dibolia tricolor*, Ordubad, REITTER, p. 127, Wien. ent. Zeit. xvii, n. sp.
- Donacia aquatica* var. n. *concinna*, WEISE, p. 179, Arch. Naturges. lxiv.
- D. brevicollis*, Amurland, *nitidicollis*, p. 177, *wiepkeni*, p. 188, China, WEISE, Arch. Naturges. lxiv, n. spp.
- Doryphora venezuelensis*, p. 52, *scripta*, *specularis*, p. 53, *castanea*, *facialis*, p. 54, *brunneostriata*, p. 55, *aenea*, p. 56, S. America, JACOBY, Entomologist, 1898, n. sp.
- Enneamera flavicollis*, *bifasciata*, Borneo, JACOBY, p. 378, Ann. Soc. ent. Belgique, xlii, n. spp.
- Epitrix parvula*, natural history, HOWARD, p. 123, Yearb. U. S. Dep. Agric. 1898.
- Eurydemus porosicollis*, Cameroons, JACOBY, p. 239, P. Zool. Soc. London, 1898; *E. semivittatus*, Somaliland, JACOBY, p. 525, Ann. Mus. Genova, xxxix : n. spp.
- Gastroidea viridula* var. n. *cyanescens*, WEISE, p. 189, Arch. Naturges. lxiv.
- Gynandrophthalma abdominalis*, Pretoria, JACOBY, p. 349, Ann. Nat. Hist. (vii) i; *G. bicolor*, p. 217, *varipes*, p. 218, *babioides*, *nitidicollis*, pl. xxii, fig. 9, p. 219, S. Africa, JACOBY, P. Zool. Soc. London, 1898; *G. somalensis*, Somaliland, JACOBY, p. 522, Ann. Mus. Genova, xxxix : n. spp.
- Haltica chalybea*, habits and life-history, SLINGERLAND (1145).
- H. nigritula*, Texas, LINELL, p. 484, P. U. S. Mus. xx, n. sp.
- Halticova*, n. g.?, near *Argopistes*, for *H. rufoguttata*, n. sp., Madagascar, FAIRMAIRE, p. 428, Ann. Soc. ent. Belgique, xlii.
- Hispa usambarica*, Africa, WEISE, p. 223, Arch. Naturges. lxiv; *H. sobrina*, *capicola*, p. 121, *gracilis*, *tenella*, *zulu*, p. 122, *congrua*, *dissimilis*, *gratula*, p. 123, *inanis*, *perfida*, *ambigua*, p. 124, *litigiosa*, *natalica*, p. 125, *vexatrix*, *ovampo*, *vicinalis*, p. 126, *omarramba*, *perplexa*, p. 127, *straminca*, *decipiens*, *delicata*, p. 128, *eximia*, *fallaciōsa*, *lanigera*, p. 129, S. Africa, PÉRINGUEY, Ann. S. Afric. Mus. i; *H. montivaga*, p. 261, *xanthopus*, p. 262, Darjeeling, GESTRO, Termes. Fuzetek, xxi; *H. hostica*, Nias, GESTRO, p. 219, Ann. Mus. Genova, xxxix : n. spp.
- Hispella spuria*, *promontorii*, S. Africa, PÉRINGUEY, p. 118, Ann. S. African Mus. i; *H. wakkeri*, Java, ZEHNTNER (1340) : n. spp.
- Hypericia*, sect. n. of *Chrysomela*, BEDEL, p. 258, Faune Seine, Coléoptères.
- Iphinoë*, n. g., near *Lacoptera*, p. 540, for *I. ganglbaueri*, n. sp., Africa, p. 541, SPAETH, Verh. Ges. Wien, 1898.
- Isnus*, n. g. near *Cænobius*, for *I. niger*, p. 216, *lætificus*, p. 217, n. spp., Africa, WEISE, Arch. Naturges. lxiv.
- Ivongius mauritica*, Mauritius, JACOBY, p. 118, Tr. ent. Soc. London, 1898; *I.?* *parvulus*, Somaliland, JACOBY, p. 526, Ann. Mus. Genova, xxxix : n. spp.
- Labidostomis humeralis*, oviposition, RUPERTSBERGER, p. 305, Illustr. Zeitschr. Ent. iii.
- L. trigemina*, Kurdistan, WEISE, p. 180, Arch. Naturges. lxiv, n. sp.

- Laccoptera longicornis*, Zanzibar, WEISE, p. 220, Arch. Naturges. lxiv ;
L. humerosa, Madagascar, FAIRMAIRE, p. 258, Ann. Soc. ent. Belgique, xlii ; *L. perrieri*, *regularis*, Madagascar, FAIRMAIRE, p. 429, t. c. : n. spp.
- Lachnæa fulvicollis*, Niger, JACOBY, p. 222, P. Zool. Soc. London, 1898, n. sp.
- Lactica*=(*Halticodes*), BLACKBURN, p. 232, Tr. Soc. S. Austral. xxii.
- Lamprosoma concolor*, natural history, KOLBE, pp. 22-29, Zeitschr. Ent. Breslau, xxiii.
- Lamprosphærus igneipennis*, Amazons, JACOBY, p. 162, Entomologist, 1898, n. sp.
- Lema picticollis*, p. 213, *angustomarginata*, *cyaneoplagiata*, pl. xxii, fig. 2, p. 214, *pubifrons*, p. 215, S. Africa, JACOBY, P. Zool. Soc. London, 1898 ; *L. angulosa*, Madagascar, FAIRMAIRE, p. 424, Ann. Soc. ent. Belgique, xlii ; *L. perrieri*, Madagascar, FAIRMAIRE, p. 496, t. c. ; *L. rugosa*, Celebes, HELLER, p. 38, Abh. Mus. Dresden, vii, No. 3 ; *L. moribunda*, New Guinea, *medioplagiata*, N. Australia, JACOBY, p. 353, Ann. Soc. ent. Belgique, xlii ; *L. longipennis*, *jacobina*, *lebioides*, p. 474, N. America, LINELL, P. U. S. Mus. xx : n. spp.
- Leptinotarsa decemlineata* in the Pyrenees, LESNE, p. 306, Bull. Soc. ent. France, 1898.
- Leptispa gracilis*, Cape Town, PÉRINGUEY, p. 113, Ann. S. African Mus. i, n. sp.
- Lina tremulæ*, physiology during metamorphosis, TERRE (1202) ; *L. scripta*, habits, metamorphosis, LOWE (795).
- Liprus longicollis*, Borneo, JACOBY, p. 376, Ann. Soc. ent. Belgique, xlii, n. sp.
- Lochmæa suturalis*, life-history, GRIMSHAW, pp. 27-29, Ann. Scott. N. H. 1898.
- L. limbata*, Syria, PIC, p. 93, Rev. Sci. Bourbon, xi, n. sp.
- Longitarsus recticollis*, Calcutta, JACOBY, p. 188, Ann. Soc. ent. Belgique, xlii ; *L. jansoni*, Somaliland, JACOBY, p. 532, Ann. Mus. Genova, xxxix : n. spp.
- Luperodes assamensis*, Assam, JACOBY, p. 189, Ann. Soc. ent. Belgique, xlii, n. sp.
- Luperomorpha weisei*, India, JACOBY, p. 189, Ann. Soc. ent. Belgique, xlii, n. sp.
- Luperus* (*Calomicrus*) *impressithorax*, Andalusia, p. 311, *L. mauritanicus*, Algeria, p. 312, PIC, Bull. Soc. ent. France, 1898 ; *L. brevicollis*, *rectangulus*, Akbès, WEISE, p. 214, Arch. Naturges. lxiv : n. spp.
- Lygaria*=(*Oidosoma* Qued.), JACOBY, p. 240, P. Zool. Soc. London, 1898.
- Macrogonus quadrivittatus*, Queensland, JACOBY, p. 352, Ann. Soc. ent. Belgique, xlii, n. sp.
- Macrolema marginata*, Queensland, JACOBY, p. 350, t. c., n. sp.
- Macrolenes dentipes* Ol.=(*ruficollis*, auct.), WEISE, p. 183, Arch. Naturges. lxiv.
- Malacosoma tibialis*, Somaliland, JACOBY, p. 533, Ann. Mus. Genova, xxxix ; *M. transvaalensis*, Zoutpansberg, JACOBY, p. 357, Ann. Nat. Hist. (vii) i : n. spp.
- Malegia affinis*, Natal, JACOBY, p. 227, P. Zool. Soc. London, 1898, n. sp.
- Manobia biplagiata*, Java, JACOBY, p. 376, Ann. Soc. ent. Belgique, xlii, n. sp.
- Mecistes indigaceus*, Natal, JACOBY, p. 235, P. Zool. Soc. London, 1898, n. sp.
- Megapyga angulicollis*, Borneo, SPAETH, p. 537, Verh. Ges. Wien, 1898, n. sp.
- Megascelis texana*, Texas, LINELL, p. 474, P. U. S. Mus. xx, n. sp.
- Megasceloides*, n. g., near *Megascelis*, for *M. pallidus*, n. sp., Australia, JACOBY, p. 352, Ann. Soc. ent. Belgique, xlii.

- Melasoma tibialis*, *kraatzi*, Africa, WEISE, p. 213, Arch. Naturges. lxiv, n. spp.
- Melitonoma pictipennis*, p. 350, *duodecimpunctata*, p. 351, Transvaal, JACOBY, Ann. Nat. Hist. (vii) i; *M. marshalli*, Natal, JACOBY, p. 216, pl. xxii, fig. 5, P. Zool. Soc. London, 1898 : n. spp.
- Menius chalceatus*, redescribed, JACOBY, p. 239, P. Zool. Soc. London, 1898.
- Merista elongata*, Tibet, JACOBY, p. 190, Ann. Soc. ent. Belgique, xlii, n. sp.
- Mesomphalia oblita* Dej. = (*inornata*, *lucida*, and *illepida* Boh.), SPAETH, p. 274, Verh. Ges. Wien, 1898.
- Mesomphalia luctuosa*, Espirito Santo, SPAETH, l. c.; *M. imperialis*, Brazil, SPAETH, p. 538, t. c. : n. spp.
- Metachroma viticola*, Texas, LINELL, p. 481, P. U. S. Mus. xx, n. sp.
- Metriona catenata* = (*physodes* Boh.), SPAETH, p. 280, Verh. Ges. Wien, 1898.
- M. lyra*, Brazil, SPAETH, p. 542, t. c. : n. spp.
- Metriopepla rubrocostata*, Madagascar, FAIRMAIRE, p. 258, Ann. Soc. ent. Belgique, xlii, n. sp.
- Miopristis pusilla*, Natal, JACOBY, p. 220, pl. xxii, fig. 7, P. Zool. Soc. London, 1898; *M. distanti*, Pretoria, JACOBY, p. 346, Ann. Nat. Hist. (vii) i : n. spp.
- Monolepta minima* = (*alpina* Bk.), BLACKBURN, p. 233, Tr. Soc. S. Austral. xxii.
- Nadrana* = (*Batusia* Jac.) and *N. raapi* and *Macrima pallidicornis* are the same, JACOBY, p. 627, Ann. Mus. Genova, xxxix.
- Neocloides*, n. g., *Myochroinae*, for *N. plagiatus*, n. sp., New Guinea, JACOBY, p. 365, Ann. Soc. ent. Belgique, xlii.
- Nisotra pallida*, Somaliland, JACOBY, p. 527, Ann. Mus. Genova, xxxix, n. sp.
- Nossiæcus lateralis*, Mauritius, JACOBY, p. 119, Tr. ent. Soc. London, 1898, n. sp.
- Omaspides nattereri*, Brazil, SPAETH, p. 276, Verh. Ges. Wien, 1898, n. sp.
- Omoplata fruhstorferi*, Brazil, SPAETH, p. 275, t. c., n. sp.
- Oncocephala promontorii*, S. Africa, PÉRINGUEY, p. 115, Ann. S. African Mus. i, n. sp.
- Ophrida sumatrana*, Sumatra, JACOBY, p. 377, Ann. Soc. ent. Belgique, xlii, n. sp.
- Orsodacna lineola*, *cerasi*, colour-variation, CHAMPION, p. 175, Ent. Mag. 1898.
- Oxycephala obtusirostris*, New Guinea, GESTRO, p. 257, Termes. Fuzetek, xxi, n. sp.
- Pachybrachys cedri*, p. 139, *P. (Pachystylus) obscurior*, p. 140, Algeria, PIC, Miscell. ent. vi, n. spp.
- Paridea balyi*, Assam, JACOBY, p. 190, Ann. Soc. ent. Belgique, xlii, n. sp.
- Paropsis* : part III. of revision, BLACKBURN, pp. 218–263, P. Linn. Soc. N. S. Wales, xxiii.
- P. dulcior*, p. 231, *semivittata*, p. 232, *rufobrunnea*, p. 234, *angustipes*, p. 236, *difficilis*, p. 237, *mentitrix*, p. 239, *subcincta*, p. 244, *badia*, p. 247, *pachyta*, *gacilipes*, p. 249, *nupta*, p. 252, *madida*, p. 254, *opaciceps*, p. 255, *io*, p. 260, *atalanta*, p. 261, Australia, BLACKBURN, t. c., n. spp.
- Phædonia* and *Mesoplatys*, note, WEISE, p. 212, Arch. Naturges. lxiv.
- Phygasia gestroi*, Somaliland, JACOBY, p. 527, Ann. Mus. Genova, xxxix; *P. pallida*, Pretoria, JACOBY, p. 356, Ann. Nat. Hist. (vii) i; *P. indica*, India, JACOBY, p. 187, Ann. Soc. ent. Belgique, xlii : n. spp.
- Phygasoma*, n. g., near *Phygasia*, p. 379, for *P. borneoensis*, n. sp., Kina Balu, p. 380, JACOBY, t. c.
- Phyllobrotica nigratarsis*, N. America, LINELL, p. 482, P. U. S. Mus. xx, n. sp.

- Phyllocharis gracilis, fulvifrons*, N. S. Wales, JACOBY, p. 366, Ann. Soc. ent. Belgique, xlii, n. spp.
- Phyllotreta tenuimarginata*, p. 528, *flavifrons*, p. 529, Somaliland, JACOBY, Ann. Mus. Genova, xxxix, n. spp.
- Physonota lutarella* var. n. *caucana*, SPAETH, p. 277, Verh. Ges. Wien, 1898.
- Phytodecta 5-punctata*, variation, PENECKE, p. 254, Wien. ent. Zeit. xvii.
- P. inconditus*, Pedong, WEISE, p. 213, Arch. Naturges. lxiv, n. sp.
- Plagiodera*: notes on the species, WEISE, pp. 210, 212, Arch. Naturges. lxiv.
- P. ferrugata*, W. Africa, p. 211, *chinensis*, Shanghai, p. 212, *id.*, t. c.; *P. purpurea*, Utah, LINELL, p. 482, P. U. S. Mus. xx : n. spp.
- Plateumaris rustica* var. n. *picipes*, WEISE, p. 180, Arch. Naturges. lxiv.
- P. amurensis*, Amurland, *id.*, t. c., p. 179, n. sp.
- Platymela blackburni*, N. S. Wales, JACOBY, p. 370, Ann. Soc. ent. Belgique, xlii, n. sp.
- Platypria (Dichirisa) usambarica*, Africa, WEISE, p. 224, Arch. Naturges. lxiv; *P. mashuna, transvaalensis*, p. 116, *connexa*, p. 117, S. Africa, PÉRINGUEY, Ann. S. African Mus. i; *P. squalida*, Celebes, GESTRO, p. 49, Notes Leyden Mus. xx : n. spp.
- Platyxantha citernii*, Somaliland, JACOBY, p. 533, Ann. Mus. Genova, xxxix, n. sp.
- Podispa extrema*, S. Africa, PÉRINGUEY, p. 117, Ann. S. African Mus. i, n. sp.
- Pæcilomorpha hirsuta*, Mashonaland, JACOBY, p. 216, pl. xxii, fig. 1, P. Zool. Soc. London, 1898, n. sp.
- Prioptera whitei* var. = (*trabeata* Fairm.), SPAETH, p. 273, Verh. Ges. Wien, 1898.
- Pseudedusia*, n. g., near *Argoa*, for *P. fulvipes* n. sp., Mashonaland, JACOBY, p. 229, P. Zool. Soc. London, 1898.
- Pseudeugonotes*, n. g., *Halticinae*, for *P. vannutellii*, n. sp., Somaliland, JACOBY, p. 532, Ann. Mus. Genova, xxxix.
- Pseudispella machetes*, E. India, GESTRO, p. 260, Termes. Fuzetek, xxi, n. sp.
- Pseudivongius aeneus*, Natal, JACOBY, p. 228, P. Zool. Soc. London, 1898, n. sp.
- Pseudocolaspis delagrangi*, p. 93, *anatolica*, p. 94, Syria, PIC, Rev. Sci. Bourbon, xi; *P. costata*, pl. xxii, fig. 12, *lateralis*, p. 230, *laticollis*, p. 231, S. Africa, JACOBY, P. Zool. Soc. London, 1898 : n. spp.
- Pseudocophora nicobarica*, Nicobar islands, JACOBY, p. 189, Ann. Soc. ent. Belgique, xlii, n. sp.
- Pseudomalegia fulvipes*, Natal, JACOBY, p. 227, P. Zool. Soc. London, 1898, n. sp.
- Rhembastus kraatzi*, Cameroons, *recticollis*, Abyssinia, p. 237, *viridis*, Ashanti, p. 238, JACOBY, t. c., n. spp.
- R. insignitus*, Pretoria, JACOBY, p. 353, Ann. Nat. Hist. (vii) i, n. sp.
- Rhyparida raapi*, Nias island, JACOBY, p. 625, Ann. Mus. Genova, xxxix; *R. ribbei*, Salomon Arch., *semipurpurea*, Fergusson island, p. 355, *costata*, Palawan, *apicipennis*, p. 356, *nigripes*, Fergusson island, *brevilineata*, North Australia, p. 357, *bimaculata*, p. 358, *pallida*, Fergusson island, *brevicollis*, p. 359, *melanocephala*, Fergusson island, *blackburni*, N. Australia, p. 360, *fruhstorferi*, Roon, JACOBY, Ann. Soc. ent. Belgique, xlii : n. spp.
- Richmondia*, n. g., *Chrysomelinae*, for *R. camelus*, n. sp., N. S. Wales, JACOBY, p. 371, t. c.
- Rudolphia*, n. g., p. 534, *Galerucinae*, for *R. pallida*, n. sp., Somaliland, p. 535, JACOBY, Ann. Mus. Genova, xxxix.
- Sagra stevensi*, characters, JACOBY, p. 521, t. c.

- S. perrieri*, Madagascar, FAIRMAIRE, p. 424, Ann. Soc. ent. Belgique, xlii;
S. borneensis, Kina Bala, JACOBY, p. 353, *t. c.* : n. spp.
Salaminia, n. n. for *Salamis* Chap. 1875, *S. concinna* Baly (sub *Haplo-sonyx*) = (*haroldi* Chap.), HELLER, p. 37, Abh. Mus. Dresden, vii, No. 3.
S. macrocephala, Celebes, *id. t. c.*, p. 38, n. sp.
Scelodonta pectoralis, Natal, JACOBY, p. 228, P. Zool. Soc. London, 1898;
S. laeviuscula, Celebes, HELLER, p. 37, Abh. Mus. Dresden, vii, No. 3 : n. spp.
Sebaethe semiviridis, Perak, *sulphurea*, Lombok, JACOBY, p. 372, Ann. Soc. ent. Belgique, xlii, n. spp.
Sphaeromela, n. sect. of *Chrysomela*, BEDEL, p. 260, Faune Seine, Coléoptères.
Stethomela foveipennis, N. S. Wales, p. 368, *flavomarginata*, New Guinea, *fulvitaris*, Queensland, p. 369, JACOBY, Ann. Soc. ent. Belgique, xlii, n. spp.
Stictomela, n. g., near *Entomoscelis*, for *S. varians*, n. sp., E. Africa, WEISE, Arch. Naturges. lxiv.
Sutrea flavofasciata, New Guinea, *fruhstorferi*, Lombok, p. 373, *apicipennis*, Trobriand island, *flava*, Philippines, p. 374, *apicicornis*, Borneo, p. 375, JACOBY, Ann. Soc. ent. Belgique, xlii, n. spp.
Syagrus marshalli, Mashonaland, JACOBY, p. 236, P. Zool. Soc. London, 1898; *S. bottegi*, Somaliland, JACOBY, p. 524, Ann. Mus. Genova, xxxix : n. spp.
Thelyterotarsus regeli, Dshungaria, JACOBSON, p. 194, Annuaire Mus. St. Petersb. 1898, n. sp.
Thyamis menthae, France, BEDEL, p. 189, Faune Col. Seine, v, n. sp.
Titubæa elegans, Tangier, p. 182, *rugulosa*, Araxes Valley, p. 183, WEISE, Arch. Naturges. lxiv; *T. pretoriae*, Transvaal, JACOBY, p. 347, Ann. Nat. Hist. (vii) i : n. spp.
Trichochrysea = (*Heteraspis* Bl. = *Scelodonta* Westw.), JACOBY, p. 186, Ann. Soc. ent. Belgique, xlii.
T. purpureamaculata, India, JACOBY, p. 187, *t. c.*, n. sp.
Trichostola vestita Boh., p. 113, *puberula* Boh., p. 114, notes on, *T. chapuisi*, n. n. for *vestita* Chap. p. 114, JACOBY, Tr. ent. Soc. London, 1898.
T. aurata, p. 115, *striatipennis*, *variegata*, p. 116, *alluaudi*, p. 117, Mauritius, JACOBY, *t. c.*, n. spp.
Wallacea raapii, Nias, GESTRO, p. 218, Ann. Mus. Genova, xxxix, n. sp.

EROTYLIDÆ, LANGURIIDÆ.

[Cf. FAIRMAIRE (369), GORHAM (474, 478), REITTER (1002), RITSEMA (1034, 1035).]

- Acropteroxys acuminatus*, Mexico, GORHAM, p. 247, Biol. Centr.-Amer. Col. vii, n. sp.
Brachylon, n. g., near *Dacne*, p. 256, for *B. breve*, n. sp., Central America, p. 257, GORHAM, *t. c.*
Cyclomorphus sordidus, Mexico, GORHAM, p. 254, *t. c.*, n. sp.
Dasydactylus aeneopiceus, Mexico, GORHAM, p. 248, *t. c.*, n. sp.
Euxestus ? *piciceps*, Grenada, GORHAM, p. 336, P. Zool. Soc. London, 1898, n. sp.
Hapalips, placed in *Languriides*, GORHAM, p. 250, Biol. Centr.-Amer. Col. vii.
H. cribricollis, p. 250, *reitteri*, *flohri*, p. 251, *parallelus*, p. 252, Central America, *id. t. c.*; *H. grousellei*, St. Vincent, GORHAM, p. 334, pl. xxvii, figg. 11, 12, P. Zool. Soc. London, 1898 : n. spp.

- Helota candezei*, Sumatra, p. 199, *maricæ*, Bootang, p. 249, *olliffii*, p. 251, *jordanii*, p. 252, Assam, RITSEMA, Notes Leyden Mus. xx, n. spp.
Mycotretus erraticus, Mexico, GORHAM, p. 254, Biol. Centr.-Amer. Col. vii, n. sp.
Plastococcus, n. g., near *Ægithus* for *P. atricinctus*, p. 255, *apicalis*, p. 256, n. spp., Panama, GORHAM, t. c.
Thallis convexiuscula, Madagascar, FAIRMAIRE, p. 435, Ann. Soc. ent. Belgique, xlii, n. sp.
Thallisella, affinities, *T. malasiæ* referred to *Paracladoxena*, GORHAM, p. 248, Biol. Centr.-Amer. Col. vii.
T. crotchi, *conradti*, Central America, *id.* p. 249, t. c., n. spp.
Triplax nigritarsis, Alpes maritimes, REITTER, p. 340, Deutsche ent. Zeitschr. 1898; *T. coquerelii*, *perrieri*, p. 431, *latecincta*, *ustulata*, *forticornis*, p. 432, *latitarsis*, *terminalis*, *tripartita*, p. 433, *tibialis*, *caligata*, *fuscitarsis*, *alternipes*, p. 434, *apicata*, p. 435, Madagascar, FAIRMAIRE, Ann. Soc. ent. Belgique, xlii : n. spp.

ENDOMYCHIDÆ.

- [Cf. FAIRMAIRE (369, 370), GORHAM (478), HELLER (532).]
Beccaria orca, Celebes, HELLER, p. 41, pl. iii, figg. 7, 17, Abh. Mus. Dresden, vii, No. 3, n. sp.
Dialexia punctipennis, Grenada, GORHAM, p. 338, P. Zool. Soc. London, 1898, n. sp.
Haploscelis compactus, *quadricollis*, *curtulus*, Madagascar, FAIRMAIRE, p. 259, Ann. Soc. ent. Belgique, xlii, n. spp.
Lycoperdina apicata, *perrieri*, Madagascar, FAIRMAIRE, p. 436, t. c., n. spp.
Milichius fasciatus, Celebes, HELLER, p. 40, Abh. Mus. Dresden, vii, No. 3, n. sp.
Mycetina heteropunctata, Celebes, HELLER, pl. iii, fig. 8, p. 40, t. c., n. sp.
Rhymbus globosus, Grenada, p. 337, *unicolor*, St. Vincent, p. 338, GORHAM, P. Zool. Soc. London, 1898, n. spp.
Spathomeles bonthainicus, Celebes, HELLER, p. 39, pl. iii, fig. 13, Abh. Mus. Dresden, vii, No. 3, n. sp.
Stenodina, n. g., near *Rhanis*, p. 498, for *S. quadriguttata*, n. sp., Madagascar, FAIRMAIRE, Ann. Soc. ent. Belgique, xlii.

COCCINELLIDÆ.

- [Cf. GORHAM (474, 478), WEISE (1312, 1313, 1315, 1316, 1317).]
Adalia pipitzi=(*Verania suturata* Fairm.), WEISE, p. 237, Arch. Naturges. lxiv; *A. deficiens*, *rufipennis*, characters, WEISE, p. 234, t. c.
Adonia variegata var. n. *albicollis*, CHOBOUT, p. 87, Rev. Ent. franc. xvii.
Alesia comma=(*trivittata* Reiche), WEISE, p. 522, Ann. Soc. ent. Belgique, xlii.
A. connexa, Cameroons, WEISE, p. 117, Deutsche ent. Zeitschr. 1898, n. sp.
Aspidimerus stellaris, *nigrovittatus*, distinguished, WEISE, p. 237, Arch. Naturges. lxiv.
Boschalis podagrica, Cameroons, WEISE, p. 121, Deutsche ent. Zeitschr. 1898; *B. marginalis*, Usambara, WEISE, p. 197, Ann. Soc. ent. Belgique, xlii, n. sp.
Brachyacantha lepida var. n. *confluens*, WEISE, p. 237, Arch. Naturges. lxiv.
Chilocorus adustus, Gaboon, WEISE, p. 119, Deutsche ent. Zeitschr. 1898; *C. subaenescens*, Sumbawa, p. 227, *calvus*, Africa, *diadema*, Australia, p. 228, *melas*, Java, p. 229, WEISE, Arch. Naturges. lxiv, n. spp.

- Cinachya*, n. g., near *Neaporia*, for *C. picta*, n. sp., Mexico, p. 263, GORHAM, Biol. Centr.-Amer. Col. vii.
- Coccidula suturalis* Ws. = (*occidentalis* Horn), WEISE, p. 238, Arch. Naturges. lxiv.
- C.?* *ferruginea*, Mexico, GORHAM, p. 264, Biol. Centr.-Amer. Col. vii, n. sp.
- Coccinella bennigseni*, East Africa, WEISE, p. 196, Ann. Soc. ent. Belgique, xlii, n. spp.
- Cælophora stigmatica*, W. Africa, WEISE, p. 523, *t. c.*, n. sp.
- Cryptognatha annulata*, *amicta*, p. 259, *terminata*, *melanodera*, *erythrodera*, *ocularis*, p. 260, *pectoralis*, Centr. America, *amabilis*, *castanea*, Brazil, p. 261, GORHAM, Biol. Centr.-Amer. Col. vii; *C. melanura*, Grenada, GORHAM, p. 341, pl. xxvii, fig. 6, P. Zool. Soc. London, 1898 : n. sp.
- Cycloneda corallina*, *bistillata*, p. 125, *10-guttata*, *arcana*, p. 126, S. America, WEISE, Deutsche ent. Zeitschr. 1898, n. spp.
- Cydonia signaticollis*, Usambara, WEISE, p. 196, Ann. Soc. ent. Belgique, xlii, n. sp.
- Egleis delta*, N. S. Wales, WEISE, p. 225, Arch. Naturges. lxiv, n. sp.
- Endochilus*, n. g., p. 119, near *Chilocorus*, for *E. cavifrons*, *rubicundus*, p. 120, *minor*, p. 121, n. spp., Cameroons, WEISE, Deutsche ent. Zeitschr. 1898.
- Epilachna* and allies, characters, WEISE, p. 100, Deutsche ent. Zeitschr. 1898; *E. 10-maculata* Redt. = (*maculivestis* Muls.), WEISE, p. 237, Arch. Naturges. lxiv; *E. amœna* var. n. *kamerinensis*, p. 101, *similis*, varr. p. 108, WEISE, Deutsche ent. Zeitschr. 1898; *E. defecta*, pl. xiii, figg. 9–11, *borealis*, figg. 12–16, *varivestis*, figg. 17–20, *modesta*, fig. 23, *patula*, fig. 26, *polluta*, fig. 24, *mitis*, fig. 25, figured, Biol. Centr.-Amer. Col. vii; *E. corrupta*, habits, metamorphosis, CHITTENDEN, pp. 251, 252, cuts, Yearb. U. S. Dep. Agric. 1898.
- E. kolbei*, p. 102, *zenkeri*, p. 103, *scitula*, *conradti*, p. 104, *obliterata*, p. 105, *apicalis*, *kasebergi*, p. 106, Africa, WEISE, Deutsche ent. Zeitschr. 1898; *E. ephippiata*, Usambara, WEISE, p. 192, Ann. Soc. ent. Belgique, xlii; *E. vulnerata*, pl. xiii, fig. 21, p. 243, *vanpatteni*, fig. 22, p. 244, *inepta*, p. 245, Central America, GORHAM, Biol. Centr.-Amer. Col. vii : n. spp.
- Eriopis marginicollis*, Chili, WEISE, p. 225, Arch. Naturges. lxiv, n. sp.
- Exochomus corallinus*, Usambara, WEISE, p. 196, Ann. Soc. ent. Belgique, xlii, n. sp.
- Halysia laminata*, Cameroons, WEISE, p. 116, Deutsche ent. Zeitschr. 1898, n. sp.
- Hyperaspis concolor* and *campestris*, distinguished, GERHARDT, p. 17, Zeitschr. Ent. Breslau, xxiii.
- H. usambarica*, Tanga, WEISE, p. 198, Ann. Soc. ent. Belgique, xlii, n. sp.
- Merma*, n. g., p. 123, near *Solanophila*, for *M. limbata*, *spilota*, n. spp., Cameroons, p. 124, WEISE, Deutsche ent. Zeitschr. 1898.
- Neda*: the species and varieties, WEISE, pp. 230–234, Arch. Naturges. lxiv.
- Ortalia ovulum*, Cameroons, WEISE, p. 122, Deutsche ent. Zeitschr. 1898, n. sp.
- Platynaspis salaamensis*, E. Africa, WEISE, p. 197, Ann. Soc. ent. Belgique, xlii, n. sp.
- Poria stellaris*, Panama, GORHAM, p. 262, Biol. Centr.-Amer. Col. vii, n. sp.
- Protothea*, n. g., p. 226, for *P. firma*, n. sp., Java, p. 227, WEISE, Arch. Naturges. lxiv.
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- Neopasites*, n. g., type *Phileremus fulviventris* Cress., ASHMEAD, p. 284, Psyche, viii.
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- Eumenes antennata*, India, BINGHAM, p. 121, pl. A, fig. 8, J. Bombay Soc. xii; *E. vishnu*, India, p. 36, *erythropoda*, Malacca, p. 38, CAMERON, Mem. Manchester Soc. xlii, No. 11 : n. spp.

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- Polistes*; the European species, the following being apparently new; viz.
P. associa, p. 89, *fœderata*, *dubia*, *opinabilis*, p. 90, KOHL, Ann. Hofmus. Wien, xiii, pl. iii; *P. thoracicus*, p. 447, *geminatus*, p. 448, Brazil, Fox, P. Ac. Philad. 1898 : n. spp.
- Polybia latior*, p. 451, *flavitincta*, *tinctipennis*, p. 452, *chapadæ*, p. 453, *gorytoides*, p. 454, *suffusa*, *frontalis*, p. 455, *marginata*, p. 456, Brazil, Fox, *t. c.*, n. spp.
- Pterochilus fulvipennis*, Poona, CAMERON, p. 39, pl. iv, fig. 3, Mem. Manchester Soc. xlii, No. 11, n. sp.
- Quartinia major*, Oran, p. 363, *capensis*, Algoa Bay, p. 365, KOHL, Termes. Fuzetek, xxi, n. spp.
- Rhygchium oculatum* var. n. *somalicum*, MAGRETTI, p. 594, Ann. Mus. Genova, xxxix.
- Vespa orientalis*, notes on, WALKER, p. 171, Entomologist, 1898; *V. austriaca* inquiline in the nest of *Vespa rufa*, SAUNDERS, p. 211, Ent. Mag. 1898; *V. crabro*, nests figured, BEUTENMULLER, p. 199, pls. ix, x, J. N. York ent. Soc. vi.

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- A. (Psammophila) schmiedeknechtii*, Egypt, KOHL, p. 340, Termes. Fuzetek, xxi, n. sp.
- Ammoplanus kohlii*, Algeria, KOHL, p. 326, *t. c.*, n. sp.
- Ampulex mæbii* ♂, KOHL, p. 331, *t. c.*
- A. mocsaryi*, Java, p. 327, *crassicornis*, Africa Trop., p. 329, KOHL, *t. c.*, n. spp.
- Aphilanthops*, monograph of N. American, DUNNING, pp. 19–26, Tr. Amer. ent. Soc. xxv.
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- Bembex rostrata*, habits, RIEDEL, p. 347, Illustr. Zeitschr. Ent. iii.
- Brachycistis nudus*, p. 281, *indiscretus*, *aqualis*, *triangularis*, p. 284, *brevis*, *bimaculatus*, p. 285, N. America, Fox, Tr. Amer. ent. Soc. xxv, n. spp.
- Cerceris schmiedeknechtii*, p. 94, *annexa*, p. 95, Algeria, KOHL, Ann. Hofmus. Wien, xiii; *C. monocera*, Senegal, p. 341, *consobrina*, Spain, p. 342, *perdita*, Caucasus, p. 343, *pharaonum*, Egypt, p. 345, *euryppyga*, Oran, p. 346, *associa*, p. 348, *jakowleffii*, p. 349, Mongolia, KOHL, Termes. Fuzetek, xxi; *C. himalayensis*, Simla, BINGHAM, p. 120, J. Bombay Soc. xii : n. spp.
- Ceropales fraterna* var. n. *occidentalis*, COCKERELL, p. 455, Ann. Nat. Hist. (vii) ii.

- Chyphotes punctatus*, p. 276, *testaceipes*, *petiolatus*, *peninsularis*, p. 277, N. America, Fox, Tr. Amer. ent. Soc. xxv, n. spp.
- Crabro ægyptius*, characters, KOHL, p. 359, Termes. Fuzetek, xxi.
- C. eurypus*, Armenia, p. 358, *C. (Lindenius) abditus*, *hannibal*, Oran, p. 360, KOHL, t. c.; *C. grassator*, Simla, BINGHAM, p. 121, J. Bombay Soc. xii; *C. taprobane*, p. 30, *yerburii*, p. 32, *revelatus*, p. 34, Ceylon, CAMERON, Mem. Manchester Soc. xlii, No. 11 : n. spp.
- Diamma bicolor*, male, BEST, p. 44, Victorian Natural. xv.
- Diodontus brachycerus*, p. 91, *schmiedeknechtii*, p. 92, Algeria, KOHL, Ann. Hofmus. Wien, xiii; *D. geniculatus*, N. India, CAMERON, p. 26, Mem. Manchester Soc. xlii, No. 11 : n. spp.
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- Hypomiscophus*, subg. n., cf. *Miscophus*.
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- Morsyma* n. g., near *Myrmosa*, for *M. ashmeadii*, n. sp., California, Fox, p. 287, Tr. Amer. ent. Soc. xxv.
- Myzine bengalensis*, p. 20, *violaceipennis*, p. 21, Poona, CAMERON, Mem. Manchester Soc. xlii, No. 11, n. spp.
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- Oxybelus collaris* ♂, p. 354, *pharao* ♂, p. 356, *africanus* ♂, p. 357, KOHL, Termes. Fuzetek, xxi.
- O. (Notoglossa) phyllophorus*, Egypt, KOHL, p. 355, t. c., n. sp.
- Paramyzine*, n. n. for *Menius* Buys. nec Pasc., BERG, p. 18, Com. Mus. Buenos Aires, i.

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- Philanthus punctatus*, var. *cockerelli*, note on, COCKERELL, p. 26, Ent. News Philad. 1898.
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- Pison algericum*, Oran, KOHL, p. 353, Termes. Fuzetek, xxi, n. sp.
- Pompilus torvus*, Caucasus, p. 361, *nostras*, Austria, p. 362, *conjungens*, Croatia, p. 363, KOHL, *t. c.*; *P. vannutellii*, p. 603, *sacchii*, p. 604, Somaliland, MAGRETTI, Ann. Mus. Genova, xxxix; *P. deperditus*, Simla, BINGHAM, p. 119, J. Bombay Soc. xii : n. spp.
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- Pseudagenia sculpturata*, Spain, KOHL, p. 102, Ann. Hofmus. Wien, xiii; *P. ferruginea*, p. 46, *somalica*, p. 47, *ogadeni*, p. 48, East Africa, MAGRETTI, Ann. Mus. Genova, xxxix; *P. glabra*, Simla, BINGHAM, p. 118, J. Bombay Soc. xii : n. spp.
- Rhagigaster illustris*, Centr. Australia, KIRBY, p. 207, Horn exp. Pt. i, n. sp.
- Solierella (Sylaon) ægyptia*, Egypt, KOHL, p. 352, Termes. Fuzetek, xxi, n. sp.
- Sphex ochropterus* ♂, KOHL, p. 336, *t. c.*
- S. (Harpactopus) harpax*, Timor, p. 333, *S. (Isodontia) simplex*, New Guinea, p. 334, *egens*, New Pomerania, p. 335, *severini*, Java, p. 337, *S. errabundus*, Waigiou, p. 338, *satanas*, W. Africa, p. 339, KOHL, *t. c.*; *S. (Chlorion) consanguineus*, Abyssinia?, KOHL, p. 93, Ann. Hofmus. Wien, xiii : n. spp.
- Spilomena mocsaryi*, Hungary, KOHL, p. 325, Termes. Fuzetek, xxi, n. sp.
- Stizus schmiedeknehti*, Cairo, HANDLIRSCH, p. 489, Verh. Ges. Wien, 1898; *S. lughensis*, p. 606, *ferrandii*, p. 608, Somaliland, MAGRETTI, Ann. Mus. Genova, xxxix : n. spp.
- Tachysphex mongolicus*, Mongolia, p. 99, *collaris*, E. Africa, *melas*, p. 100, *abditus*, p. 101, Mongolia, KOHL, Ann. Hofmus. Wien, xiii, n. spp.
- Tachytes ambidens*, Sarepta, KOHL, p. 98, *t. c.*; *T. hospes*, India, BINGHAM, p. 119, pl. A, fig. 7, J. Bombay Soc. xii; *T. setigera*, Brazil, KOHL, p. 350, Termes. Fuzetek, xxi : n. spp.
- Telephoromyia anthracina*, California, ASHMEAD, p. 251, Psyche, viii; *T. punicea*, Chapada, Fox, p. 74, P. Ac. Philad. 1898 : n. spp.
- Tiphia bottegoides*, Somaliland, MAGRETTI, p. 600, Ann. Mus. Genova, xxxix; *T. fulvohirta*, Poona, CAMERON, p. 17, Mem. Manchester Soc. xlii, No. 11 : n. spp.
- Trachypus subconcolor*, p. 107, pl. A, fig. 1, *nursei*, fig. 3, p. 108, Aden, BINGHAM, J. Bombay Soc. xii, n. spp.
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Morphology and limits of segments of imago, intersegmental membranes, JANET (611).

- Morphology of thorax, numerous sections of ♀ *Myrmica rubra*, JANET (610).
- Thoracic gland and cavity in *Myrmica*: suggested mode of recognition, JANET (615).
- Alkalinity of gland-products: duration of life in decapitated individuals of *F. rufa*, JANET (616).
- Post-embryonic development of *Lasius flavus*, KARAWAIEW (631).
- Catalogue of Ants of Liguria, MANTERO (809).
- Ants'-nest Insects of Holland-Limbourg, with biological notes, WASMANN (1305).
- Origin of polymorphism in Ants, MARCHAL (815).
- Popular work on habits, KIRBY (668).
- Nature of instinct in ants, WASMANN (1297).
- Parabiosis (peculiar social phenomenon), FOREL (403).
- Ants keeping *Aphides* in confinement in Australia, GOUDIE, p. 148, Victorian Naturalist, xiv.
- Ants killed by Spiders, WASMANN (1298).
- Founding of nests and mushroom gardens by *Atta sexdens*, IHERING (591).
- Ants as distributors of fungi, BERLESE (77).
- Relation of pseudogynism in *Tetramorium* to the presence of *Lomechusa*, WASMANN, Tijdschr. Ent. xli, pp. 60-65.
- Relation of ants to *Cecropia* in S. America, ULE (1257).
- Recent progress in knowledge of geographical distribution of ants, STOLL (1189).
- Aenictus bottegoides*, Somaliland, EMERY, p. 499, Ann. Mus. Genova, xxxix, n. sp.
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- Camponotus sacchii*, Somaliland, EMERY, p. 501, Ann. Mus. Genova, xxxix; *C. reticulatus*, *denticulatus*, p. 204, *horni*, p. 205, Centr. Australia, KIRBY, Horn exp. pt. i: n. spp.
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[The titles indicated by the following numbers relate to *Parasitic Hymenoptera* and *Chrysididæ*, viz.:—ASHMEAD (27), BERTHOUMIEU (83), BIGNELL (93, 94), BINGHAM (96), BRAUNS (137), BUYSSON (167, 168, 170, 171), COCKERELL (239, 253, 254), DALLA TORRE (288, 289), DOMINIQUE (312), GIARD (461, 462, 465), HOWARD (567, 568, 569, 577), KARSCH (634), KIEFFER* (656, 659, 661, 663), KOKOUYEW (687, 688), KRIECHBAUMER (726-731), MAGRETTI (806), MARCHAL (810, 811, 812,

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CHRYSIDIDÆ.

Study of the *Chrysididæ* of the Paris Museum, with numerous remarks on characters and synonymy, R. DU BUYSSON (167).

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- Schizoloma bucephalum*, Germany, BRAUNS, p. 71, Arch. Ver. Mecklenb. li, n. sp.
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- [Cf. ASHMEAD (25), BINGHAM (96), CARPENTIER (186), COCKERELL (239), DYAR (336, 338), KIAER (655), KONOW (695–708), KULAGIN (734), LEISEWITZ (762), MARLATT (820, 821), NIEZABITOWSKI (891), SAJÓ (1059), STRAND (1193), WACHTL (1274).]

A classification of the suborder, ASHMEAD (25).

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SIRICIDÆ, ORYSSIDÆ, CEPHIDÆ.

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Paururus pinicolus, N. America, ASHMEAD, p. 179, *t. c.*, n. sp.

Sirex antennatus, Japan, MARLATT, p. 500, P. U. S. Mus. xxi, n. sp.

Siricidæ: arrangement according to their food-plants, LEISEWITZ (762).

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Xiphydria scutellata, ♀, KONOW, p. 327, Ent. Nachr. xxiv.

Xyela bakeri, Colorado, KONOW, p. 328, *t. c.*, n. sp.

TENTHREDINIDÆ.

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A. iridescens, Japan, MARLATT, p. 499, P. U. S. Mus. xxi, n. sp.

Acanthoptenos, n. g., *Schizocerinae*, type *A. weithii*, ASHMEAD, p. 212, Canad. Ent. xxx.

- Acorduleceros ventralis*, Guatemala, p. 252, *pellucidus*, *biclinius*, Texas, p. 253, KONOW, Ent. Nachr. xxiv, n. spp.
- Allantus abeillei* ♂, p. 328, *A. haberhaueri*=(*capucinus* Jak.), p. 329, KONOW, Verh. Ges. Wien, 1898.
- A. galiciensis*, Poland, NIEZABITOWSKI (891); *A. dialeucus*, p. 325, *jugalis*, Caucasus, *helveticus*, Tessin, p. 326, *scutellaris*, Caucasus, p. 327, KONOW, Verh. Ges. Wien, 1898; *A. parviceps*, Caucasus, KONOW, p. 329, Ent. Nachr. xxiv; *A. andrei*, Oran, KONOW, p. 282, Ent. Nachr. xxiv; *A. incognitus*, Simla, BINGHAM, p. 115, J. Bombay Soc. xii : n. spp.
- A. scrobiculatus*, Assam, KONOW, p. 88, Ent. Nachr. xxiv : n. spp.
- Amasis* : species tabulated, KONOW, p. 186, Wien. ent. Zeit. xvii.
- A. moricei*, Algeria, p. 188, *orientalis*, Mardin, p. 189, *andrei*, Oran, p. 190, *id. t. c.*, n. spp.
- Amauronematus sempersolis*, Arctic Norway, KIAER, p. 41, Tromso Mus. Aarsh. xix, n. sp.
- Anapeptamena*, n. g., near *Hoplocampa*, for *A. albipes*, n. sp., Assam, KONOW, p. 271, Ent. Nachr. xxiv.
- Aomodyctium*, n. g., *Strongylogasterinae*, ASHMEAD, p. 309, Canad. Ent. xxx.
- Aphilodyctium*, n. g., type *S. rubripes*, ASHMEAD, p. 310, *t. c.*
- Arge aurata*, p. 228, *nigritarsis*, p. 229, characters, KONOW, Wien. ent. Zeit. xvii.
- Arge impressifrons*, Caspian Sea, KONOW, p. 230, *t. c.*; *A. magnicornis*, Burma, p. 270, *pæcilotricha*, Borneo, p. 271, KONOW, Ent. Nachr. xxiv : n. spp.
- Athalia rufoscutellata* var. n. *pleuralis*, KONOW, p. 230, Wien. ent. Zeit. xvii.
- Blennocampa religiosa*, Japan, MARLATT, p. 495, P. U. S. Mus. xxi, n. sp.
- Blennocampinae*, generic synopsis of [taken from an unpublished work of Ashmead], DYAR, pp. 127-129, J. N. York ent. Soc. vi.—Synopsis of N. American, larvæ, DYAR, pp. 136, 137, *t. c.*
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- Caloptilia*, n. g., *Schizocerinae*, type *C. townsendi* Ashm., ASHMEAD, p. 212, Canad. Ent. xxx.
- Cephaleia lariciphila*, Europe, WACHTL, p. 93, Wien. ent. Zeit. xvii, n. sp.
- Cimbex nomurae*, p. 496, *taukushi*, *yorofui*, p. 497, *maculata*, p. 498, Japan, MARLATT, P. U. S. Mus. xxi, n. spp.
- Colochelyna*, n. g., near *Encarsioneura*, for *C. magretti*, Burma, *montana*, Sikkim, n. spp., KONOW, p. 281, Ent. Nachr. xxiv.
- Conaspidia*, n. g., near *Allantus*, for *C. sikkimensis*, n. sp., Sikkim, KONOW, p. 279, *t. c.*
- Dimorphopteryx*, n. g., type *S. pinguis* Say, ASHMEAD, p. 308, Canad. Ent. xxx.
- Dolerus arcticola*, p. 58, *schneideri*, p. 62, Arctic Norway, KIAER, Tromso Mus. Aarsh. xix; *D. obscurus*, *umbraticus*, p. 503, *picinus*, p. 504, Japan, MARLATT, P. U. S. Mus. xxi : n. spp.
- Emphytoides*, n. g., near *Emphytus*, for *E. perplexus*, p. 274, *placidus*, p. 275, *gracilis*, p. 276, n. spp., Burma, KONOW, Ent. Nachr. xxiv.
- Endelomyia*, n. g., type *M. rosæ* Harris, ASHMEAD, p. 256, Canad. Ent. xxx.
- Eriocampidea*, n. g., type *E. arigonensis* Ashm., ASHMEAD, p. 256, *t. c.*
- Gymniopterus*, n. g., *Hylotominae*, type *G. singularis*, ASHMEAD, p. 213, *t. c.*
- Hemichroa fraternalis*, p. 124, *albidovariata*, p. 125, larvæ, DYAR, J. N. York ent. Soc. vi.
- H. phytophagica*, N. America, DYAR, p. 125, *t. c.*, n. sp.
- Hemitaxonus*, n. g., type *T. dubitatus* Nort., ASHMEAD, p. 311, Canad. Ent. xxx.
- Homæoneura*, n. g., type *P. delta* Prov., ASHMEAD, p. 313, *t. c.*

- Hylotoma japonica*, Japan, MARLATT, p. 504, P. U. S. Mus. xxi; *H. mentzeliae*, New Mexico, COCKERELL, p. 456, Ann. Nat. Hist. (vii) ii : n. spp.
- Hypotaxonus*, n. g., type *P. pallipes* Say, ASHMEAD, p. 311, Canad. Ent. xxx.
- Ischyroceræa*, n. g., near *Allantus*, p. 67, for *I. hyperborea*, n. sp., Norway, p. 68, KIAER, Tromso Mus. Aarsh. xix.
- Isodyctium* (Ashm., n. g.), *floridense*, *subgregarium*, *infrequens*, p. 134, *murtfeldtiæ*, p. 135, N. America, DYAR, J. N. York ent. Soc. vi, n. spp.
- Liolyda*, n. g., type *L. frontalis* Westw., ASHMEAD, p. 209, Canad. Ent. xxx.
- Lophyridea*, n. g., type *L. tropicus* Nort., ASHMEAD, p. 226, *t. c.*
- Lophyrini*, characters and classification, KONOW, Ent. Nachr. xxiv, pp. 247, 248.
- Lophyrotoma*, n. g., *Pterygophorinæ*, type *P. interruptus* Kl., ASHMEAD, p. 230, Canad. Ent. xxx.
- Lophyrus japonicus*, Japan, MARLATT, p. 506, P. U. S. Mus. xxi; *L. townsendi*, New Mexico, COCKERELL, p. 457, Ann. Nat. Hist. (vii) ii : n. spp.
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- Lygeonematus tromsöensis*, Arctic Norway, KIAER, p. 48, Tromso Mus. Aarsh. xix, n. sp.
- Macgillivraya*, n. g., type *M. oregonensis* Ashm., ASHMEAD, p. 257, Canad. Ent. xxx.
- Macrophya* 12-*punctata* var. n. *nigrina*, KONOW, p. 237, Wien. ent. Zeit. xvii; *M. flavicoxæ*, *externa*, larvæ, DYAR, p. 173, Canad. Ent. xxx.
- M. longitarsis*, Lenkoran, KONOW, p. 237, Wien. ent. Zeit. xvii; *M. japonica*, p. 495, *nigra*, *femorata*, p. 496, Japan, MARLATT, P. U. S. Mus. xxi; *M. verticalis*, p. 87, *lubens*, p. 88, Assam, KONOW, Ent. Nachr. xxiv; *M. hastulata*, Burma, KONOW, p. 277, *t. c.* : n. spp.
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- Micrange*, n. g., *Hylotominæ*, type *A. ruficollis* Nat., ASHMEAD, p. 213, Canad. Ent. xxx.
- Monophadnoides*, n. g., type *M. rubi* Harris, ASHMEAD, p. 253, *t. c.*
- Monophadnus*=(*Senoclia* Cam.), KONOW, p. 231, Wien. ent. Zeit. xvii.
- M. atrocæruleus*, Burma, KONOW, p. 272, Ent. Nachr. xxiv; *M. furvus*, New Guinea, p. 232, *funebriis*, Borneo, p. 233, *koreanus*, Gensan, *æger*, Perak, p. 234, *decorus*, *pilosus*, Burma, *comis*, Borneo, p. 235, *scytha*, Lenkoran, p. 236, KONOW, Wien. ent. Zeit. xvii : n. spp.
- Nematus chloreus*, male, MARLATT, p. 304, Canad. Ent. xxx; *N. chlorea*, larva, DYAR, p. 123, J. N. York ent. Soc. vi.
- Neoperga*, n. g., type *P. amenaïda* Kirby, ASHMEAD, p. 232, Canad. Ent. xxx.
- Neoptilia*, n. g., *Schizocerinæ*, type *N. mexicana*, ASHMEAD, p. 213, *t. c.*
- Opisthoneura*, n. g., type *O. crevecœuri* Ashm., ASHMEAD, p. 287, *t. c.*
- Fachyprotasis aaliensis*, Norway, STRAND, p. 79, Ber. Ver. Regensb. vi; *P. pallidiventris*, Japan, MARLATT, p. 505, P. U. S. Mus. xxi : n. spp.
- Pamphilius neglectus* ♂, KONOW, p. 269, Ent. Nachr. xxiv.
- P. facetus*, Bosnia, KONOW, p. 268, *t. c.*, n. sp.
- Paraperga*, n. g., type *P. jucunda* Kirby, ASHMEAD, p. 232, Canad. Ent. xxx.
- Paraselandria*, n. g., type *S. flavens* Klug, ASHMEAD, p. 255, *t. c.*
- Parasiobla*, n. g., type *S. rufocinctus* Nort., ASHMEAD, p. 308, *t. c.*
- Pareophora pumilio*, Lenkoran, KONOW, p. 231, Wien. ent. Zeit. xvii, n. sp.
- Periclista albicollis*, p. 130, *emarginata*, p. 131, *media*, p. 132, larvæ, DYAR, J. N. York ent. Soc. vi.
- P. purpuridorsum*, p. 129, *subtruncata*, p. 131, *chionanthi*, p. 132, N. America, DYAR, *t. c.*, n. spp.

- Periclistoptera*, n. g., type *M. alba* Nort., ASHMEAD, p. 255, Canad. Ent. xxx.
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- Philomastix*, discussed, KONOW, pp. 248, 249, Ent. Nachr. xxiv.
- Phyllotoma infumata*, *P. ? flavescens*, Japan, MARLATT, p. 494, P. U. S. Mus. xxi, n. spp.
- Pleuronigra avingrata*, N. America, DYAR, p. 212, Psyche, viii, n. sp.
- Pæcilotomidea*, n. g., type *P. maculata* Nort., ASHMEAD, p. 256, Canad. Ent. xxx.
- Polystichophagus*, n. g., type *S. filicis* Klug, ASHMEAD, p. 310, *t. c.*
- Pontania borealis*, consors, galls, larvæ, DYAR, p. 121, J. N. York ent. Soc. vi.
- P. consors*, *borealis*, N. America, MARLATT, p. 302, *t. c.*, n. spp.
- Pseudocyphona*, n. g., *Schizocerinae*, type *P. mexicana*, ASHMEAD, p. 211, Canad. Ent. xxx.
- Pseudoperga*, n. g., type *P. polita* Leach, ASHMEAD, p. 232, *t. c.*
- Pseudosiobla*, n. g., type *S. excavata* Nort., ASHMEAD, p. 308, *t. c.*
- Pteronus carpini*, p. 121, *integer*, *quercus*, p. 122, larvæ, DYAR, J. N. York ent. Soc. vi.
- P. japonicus*, Japan, MARLATT, p. 494, P. U. S. Mus. xxi; *P. carpini*, N. America, MARLATT, p. 303, Canad. Ent. xxx : n. spp.
- Pterygophorinus*, n. g., type *P. analis*, ASHMEAD, p. 230, Canad. Ent. xxx.
- Rhogogastera arctica*, Norway, KIAER, p. 64, Tromsø Mus. Aarsh. xix, n. sp.
- Rhoptroceros*, n. g., near *Taxonus*, for *R. procinctus*, n. sp., Perak, KONOW, p. 276, Ent. Nachr. xxiv.
- Stromboceros phaleratus*, *lævis*, Burma, KONOW, p. 273, *t. c.*, n. sp.
- Strongylogastroidea*, n. g., type *S. apicalis* Say, ASHMEAD, p. 308, Canad. Ent. xxx.
- Syzygonidea*, n. g., type *S. cyanea* Brullé, ASHMEAD, p. 230, *t. c.*
- Taxonus alboscuteellaris*, Bukowina, NIEZABITOWSKI (891); *T. alabastris*, Lenkoran, KONOW, p. 238, Wien. ent. Zeit. xvii; *T. tricoloricornis*, Assam, KONOW, p. 86, Ent. Nachr. xxiv : n. spp.
- Tenthredo xanthoptera* male, KONOW, p. 89, Ent. Nachr. xxiv; *T. discophora* var. n. *pullata*, KONOW, p. 329, *t. c.*
- T. gribodoi*, Burma, p. 89, *tuberculifera*, p. 90, *ferruginosa*, p. 91, *assamensis*, *cyanata*, p. 92, *cretata*, p. 93, Assam, KONOW, *t. c.*; *T. pyramidata*, p. 105, *clavicornis*, *zebra*, p. 106, Assam, KONOW, *t. c.*; *T. flavida*, p. 500, *platycerus*, *mortivaga*, p. 501, *fuscoterminata*, *gifui*, p. 502, Japan, MARLATT, P. U. S. Mus. xxi : n. spp.
- Tenthredopsis triforis*, p. 329, *stramineata*, *quadrannulata*, p. 330, *casia*, *ventriflua*, p. 331, Asia Minor, *quadriforis*, Croatia, *cabrerae*, Spain, p. 332, *sororia*, *humerosa*, Caspian Sea, p. 333, KONOW, Verh. Ges. Wien, 1898, n. spp.
- Tetratneura*, n. g., type *M. ignota* Nort., ASHMEAD, p. 256, Canad. Ent. xxx.
- Tomostellus testaceus*, Galicia, NIEZABITOWSKI (891), n. sp.
- Tomostethus vegetus*, Burma, KONOW, p. 272, Ent. Nachr. xxiv, n. sp.
- Tristactus cæsariensis* and *judaicus*, synonymy, KONOW, p. 108, *t. c.*
- T. punctatus*, Asia Minor, *id. l. c.*, n. sp.
- Xyela minor* larva, DYAR, p. 176, Canad. Ent. xxx.
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(c.) *LEPIDOPTERA.*

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 Discussion as to various points of nomenclature, DURRANT and others (325).
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 Experiments as to parthenogenesis, NUSSBAUM (893).
 The structure of coloration of scales, BAER (39).
 Laws of coloration in *Lepidoptera*, PIEPERS (972).
 The coloration of *Lepidoptera*, natural selection, etc., EIMER (344).—The colours of *Lepidoptera*, Mimicry, LINDEN (783).—Principles of coloration in *Lepidoptera*, Mimicry, etc., SPULER (1171).—Natural selection, mimicry and warning colours, POULTON (981).
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 Eggs of numerous species described in Ent. Rec. x.

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- [The titles indicated by the following numbers relate to *Rhopalocera*, viz.:—AITKEN (8), AURIVILLIUS (30-32), AUSTAUT (33), BAER (39), BEUTENMULLER (87), BORDAGE (123), BUTLER (152-163), CHAPMAN (201A, omitted title, cf. p. 72), DALE (287), DECKERT (291), DISTANT (298), DIXEY (305), EIMER (344), ELWES (345), FABRE (358), FRUHSTORFER (424-426, 428-432), GIARD (464), GODMAN & SALVIN (475), GRIMSHAW (497), GROSE-SMITH (498-503), GROTE (505-507), HAGEN (515), HERZ (537), HOLLAND (548), HORMUZAKI (551), HUDSON (580), A. JANET (608), JORDAN (627, 628), KARSCH (632), KATHARINER (639), KENNEL (644), KREYE (725), LATHY (748-751), LINDEN (782-785), MACKINNON & NICÉVILLE (805), MARSHALL (822), MOORE (874), NICÉVILLE (885-887, 889), NICÉVILLE & ELWES (888), NICÉVILLE & KÜHN (890), PAGENSTECHER (923-925), PANTON (928), PIEPERS (971, 972), POULTON (981, 982), QUAIL (987), REBEL (998), RIBBE (1026, 1027), RIFFARTH (1028), RIPPON (1029), RÖBER (1037), ROTHSCHILD (1044-1047), ROTHSCHILD & JORDAN (1048), RUHMER (1051, 1052), SCHAUS (1067), SCHULTZ (1084), SCUDDER (1102), SHARPE (1132-1134), SKINNER (1142), STAUDINGER (1177, 1178), STICHEL (1186), TRIMEN (1222-1225), ULE (1257).]

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The butterflies of the Transvaal, DISTANT (298).

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For many notes on species, varieties, etc., of *Papilionidæ*, *Pieridæ*, *Satyridæ*, *Nymphalidæ*, of the Bismarck and Solomon Archipelagoes, refer to RIBBE (1026).

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O. papuensis var. n. *carolus*, FRUHSTORFER, p. 306, Berlin. ent. Zeitschr. xlii.

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BOMBYCES.

(*s. l.*, including AGARISTIDÆ, CHALCOSIIDÆ, URANIIDÆ, etc.)

[*Cf.* AURIVILLIUS (32), BEUTENMÜLLER (88), BUTLER (154), CALAS (174), CARADJA (182), CHAPMAN (200), DISTANT (299), DOGNIN (310), DRUCE (313, 314, 315, 316, 474), DUDGEON (320), DYAR (327–335), FÉRÉ (386), GAL (440–442), GROTE (504), HAMPSON (517, 520), HILL (540), HÖFNER (546), HOLLAND (547), HUDSON (580), ILLIDGE (592), KARSCH (637, 638), LEECH (760, 761), LUCAS (799), OBERTHÜR (895–898), OTTOLENGUI (916), PAGENSTECHER (924), PUNGELER (984), REBEL (995), ROTHSCHILD (1044, 1047), SASAKI (1060), SCHAUS (1065), SEMPER (1118), SNELLEN (1160), STRECKER (1194), TURNER (1244), TUTT (1248), VERNON (1266–1268), WARREN (1287–1289), WEYMER (1320).]

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- Dalaca sarta*, pl. lxxxix, fig. 2, *terea*, fig. 3, Biol. Centr.-Amer. Heter. ii.
- Dalcerina*, n. g., *Dalceridæ*, type *tijucana* Schaus, DYAR, p. 232, J. N. York ent. Soc. vi.
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- Diptilon chrysocraspis*, Bolivia, pl. xiii, fig. 7, HAMPSON, p. 365, *t. c.*, n. sp.
- Dirphia muscosa*, Rio Grande do Sul, SCHAUS, p. 141, J. N. York ent. Soc. vi, n. sp.
- Doclea zamboanga*, pl. liii, fig. 9, *boradioides*, p. 429, *duganga*, fig. 8, p. 430, Philippines, SEMPER, Schmett. Philipp. ii, n. spp.
- Drepana rubromarginata*, *grisearia*, p. 365, China, *manleyi*, Japan, p. 366, *fenestra*, China, p. 368, LEECH, Tr. ent. Soc. London, 1898, n. spp.
- Duomitus punctifer*, West Indies, HAMPSON, p. 259, pl. xvii, fig. 11, *t. c.*, n. sp.
- Dycladia melæna*, Brazil, pl. xi, fig. 8, HAMPSON, p. 292, Cat. Syntomidæ, n. sp.
- Earias subviridis*, p. 72, *parallela*, p. 73, Queensland, LUCAS, P. Soc. Queensland, xiii, n. spp.
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- E. anica*, pl. xc, fig. 13, *morona*, fig. 14, Central America, DRUCE, p. 455, *t. c.*, n. spp.
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- Epiperola*, n. g., type *drucei* Schaus, DYAR, p. 238, J. N. York ent. Soc. vi.
- Epipinconia*, n. g., *Dalceridæ*, type *flava* Wlk., DYAR, p. 232, *t. c.*
- Episcepsis rypoperas*, pl. xiv, fig. 3, p. 386, *hypoleuca*, fig. 4, p. 388, Centr. America, *eudodasia*, Brazil, fig. 24, p. 389, HAMPSON, Cat. Syntomidæ, n. spp.
- Episibine*, n. g., *Cochliidiæ*, for *auromacula* Schaus, DYAR, p. 234, J. N. York ent. Soc. vi.

- Epitoxis procridia*, Centr. Africa, pl. v, fig. 20, p. 125, HAMPSON, Cat. Syntomidæ, n. sp.
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- Euchera fractifasciata*, China, LEECH, p. 360, Tr. ent. Soc. London, 1898, n. sp.
- Euchromia amboinica*, Amboina, pl. xi, fig. 6, p. 302, *walkeri*, Ternate, fig. 7, p. 303, *auranticincta*, New Guinea, pl. xi, fig. 22, p. 304, HAMPSON, Cat. Syntomidæ, n. spp.
- Euclea viridogrisea*, Centr. America, DYAR, p. 234, J. N. York ent. Soc. vi.
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- Eudymia venata*, larva, DYAR, p. 150, J. N. York ent. Soc. vi.
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- Eupyra distincta*, Bolivia, pl. xv, fig. 15, HAMPSON, p. 433, Cat. Syntomidæ, n. sp.
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- F. ferrifusa*, Sikhim, HAMPSON, p. 634, *t. c.*, n. sp.
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- G. viridigrisea*, Sikhim, HAMPSON, p. 626, pl. i, fig. 3, *t. c.*; *G. luzonica*, Philippines, SEMPER, p. 411, pl. lii, fig. 7, Schmetterl. Philipp. ii : n. spp.
- Givira pulverosa*, West Indies, HAMPSON, p. 260, pl. xvii, fig. 12, Tr. ent. Soc. London, 1898, n. sp.
- Goodia hollandi*, E. Africa, pl. xxxiii, fig. 1, BUTLER, p. 430, P. Zool. Soc. London, 1898, n. sp.
- Gorgonidia*, n. g., p. 36, for *C. mirabilior*, n. sp., Peru, p. 37, and *Zatrephes buckleyi*, *garleppi* Druce, DYAR, J. N. York Ent. Soc. vi.
- Graphipidus* poba*, Ecuador, DOGNIN, p. 346, Ann. Soc. ent. Belgique, xlii, n. sp.

* Referred to Bombyces with doubt: name not to be found.

- Gymnelia taos*, Colombia, pl. vii, fig. 10, p. 191, HAMPSON, Cat. Syntomidæ, n. sp.
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- Hapigia xolotl*, pl. xci, fig. 19, Biol. Centr.-Amer. Heter. ii.
- Heliura emerentia*, Ecuador, DOGNIN, p. 344, Ann. Soc. ent. Belgique, xlii;
H. sanguipalpia, Brazil, HAMPSON, p. 484, Cat. Syntomidæ : n. spp.
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- Hemileuca electra*, larva, COQUILLET, p. 250, J. N. York ent. Soc. vi;
H. sororia, var. n. *olivæ*, COCKERELL, p. 252, Psyche viii; *H. olivæ*, early stages, etc., *id. t. c.*, p. 298.
- Heniocha abyssinica*, Abyssinia, AURIVILLIUS, p. 185, Ent. Tidskr. xix, n. sp.
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- Herea xanthogaster*, Cayenne, DRUCE, p. 404, Ann. Nat. Hist. (vii) i, n. sp.
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- Herpa ochracea*, p. 340, *luteola*, p. 341, China, LEECH, *t. c.*, n. spp.
- Heteranaphe jacksoni* referred to *Sabalia*, KARSCH, p. 293, Ent. Nachr. xxiv.
- Heterocampa satis* n. n. for *punctata* Dr. nec Cram., p. 457, *H. argentata*, pl. xc, fig. 18, *daona*, fig. 20, *crossæa*, fig. 21, *sagana*, fig. 23, *læca*, pl. xci, fig. 2, DRUCE, Biol. Centr.-Amer. Heter. ii.
- H. montana*, pl. xc, fig. 19, p. 457, *aconthea*, fig. 24, *H. ? nea*, fig. 22, p. 458, *pylaon*, pl. xci, fig. 1, *leona*, fig. 6, *pyrrha*, figg. 4, 5, p. 459, DRUCE, *t. c.*, n. spp.
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- Heterogyna penella*, peculiarities in life-history and characters, CHAPMAN (200).
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- Holophæa*, n. g., type *Ichoria lycone* Druce, HAMPSON, p. 265, Cat. Syntomidæ.
- H. cærulea*, Ecuador, DRUCE, p. 408, Ann. Nat. Hist. (vii) i, n. sp.
- Homæocera lophocera*, Brazil, DRUCE, p. 402, *t. c.*, n. sp.
- Homæosoma stictosoma*, Colombia, DRUCE, p. 402, *t. c.*, n. sp.
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- Hyperæschra trichostricha*, figg. 16, 16A, p. 33, DUDGEON, J. Bombay Soc. xi.
- Hyperchiria coresus*, *viridescens*, larvæ, SCHAUS, p. 150, J. N. York ent. Soc. vi.
- Hyperphara*, n. g. for *Melanchroia junctura* Wlk., HAMPSON, p. 468, Cat. Syntomidæ.
- Hypocharis*, n. g. for *Læmocharis clusia* Druce, HAMPSON, p. 271, *t. c.*
- Hypocladia*, n. g. for *Dycladia militaris* Butl., HAMPSON, p. 362, *t. c.*
- Hypopta anna*, Florida, DYAR, p. 214, Ent. News Philad. 1898, n. sp.
- Ichthyura transecta*, Sikhim, p. 36, pl. i, fig. 6, HAMPSON, J. Bombay Soc. xii, n. sp.

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- I. pichesensis*, Peru, DYAR, p. 189, *t. c.*; *I. leos*, Ecuador, *I. ? evippus*, Bolivia, DRUCE, p. 212, *Ann. Nat. Hist.* (vii) i; *I. linaza*, Paraguay, DOGNIN, p. 345, *Ann. Soc. ent. Belgique*, xlii : n. spp.
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- Leucotmemis pleuraemata*, Brazil, pl. viii, fig. 6, HAMPSON, p. 221, *t. c.*, n. sp.
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- Loxozona*, n. g., type *Josia lanceolata* Wlk., HAMPSON, p. 416, *Cat. Syntomidæ*.
- Lycomorpha schausi*, *pulchra*, N. America, DYAR, p. 34, *J. N. York ent. Soc.* vi, n. spp.
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Mesolasia, n. g., type *Sphinx hæmorrhoidalis* Stoll, HAMPSON, p. 339, Cat. Syntomidæ.
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Micronaclia, n. g., type *Pseudonaclia simplex*, HAMPSON, p. 129, *t. c.*
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- Neoselca*, n. g., type *Nola minuta* Druce, HAMPSON, p. 244, Tr. ent. Soc. London, 1898.
- Niphadolepis auricincta*, pl. xxxii, fig. 9, E. Africa, BUTLER, p. 437, P. Zool. Soc. London, 1898, n. sp.
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- N. involuta*, p. 42, *exposita*, *phylla*, p. 43, N. America, DYAR, J. N. York ent. Soc. vi, n. spp.
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- Parastatia*, n. g. for *Marissa parnassia* Möschl., HAMPSON, p. 468, Cat. Syntomidæ.

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- Patreliura*, n. g. for *Sphinx capys* Cr., HAMPSON, p. 413, Cat. Syntomidæ, n. sp.
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- Perophora inscita*, pl. lxxxviii, fig. 13, *acuta*, fig. 17, Biol. Centr.-Amer. Heter. ii.
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- Phæosphecia*, n. g. for *Myrmecopsis opaca* Wlk., HAMPSON, p. 153, Cat. Syntomidæ.
- Phalænoides proerosia obiensis* subsp. n., ROTHSCILD, p. 418, Nov. Zool. v.
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- Phragmataecia arundinis*, note on pupation, OBERTHÜR (895).
- Phyadela*, pl. xci, fig. 15, *salona*, fig. 13, p. 462, *phraortes*, figg. 11, 12, p. 463, DRUCE, Biol. Centr.-Amer. Heter. ii.
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- Pompiliodes*, n. g., type *Euchromia aliena* Wlk., HAMPSON, t. c., p. 162.
- Pompilopsis*, n. g. for *Glaucopis tarsalis* Wlk., HAMPSON, p. 161, t. c.
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- Prolimacodes triangulifera*, pl. lxxxviii, fig. 12, Biol. Centr.-Amer. Heter. ii.
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- Pseudapiconoma daphæna*, Niger, HAMPSON, p. 150, Cat. Syntomidæ, n. sp.
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- P. mimica*, Amazons, DRUCE, p. 401, Ann. Nat. Hist. (vii) i, n. sp.
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- Pseudovipsania*, n. g., type *frigida* Schaus, DYAR, p. 239, J. N. York ent. Soc. vi.
- Psilopleura*, n. g., p. 267, type *Pheia vittata* Wlk., with *P. sanguipunctata*, Brazil, pl. x, fig. 6, p. 268, n. sp., HAMPSON, Cat. Syntomidæ.
- Psilopleura polia*, Espiritu Santo, DRUCE, p. 407, Ann. Nat. Hist. (vii) i, n. sp.
- Pterygopterus cæruleus*, Mexico, HAMPSON, p. 384, Cat. Syntomidæ, n. sp.
- Ptychoglène flammans*, Arizona, DYAR, p. 39, J. N. York ent. Soc. vi ;
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- Pydna tenebralis*, ♂, pl. i, fig. 4, p. 627, *albistriga*, ♂, fig. 1, p. 629, DUDGEON, J. Bombay Soc. xi.
- P. insignis*, p. 301, *frugalis*, p. 302, China, LEECH, Tr. ent. Soc. London, 1898 ; *P. basipuncta*, Philippines, p. 415, pl. liii, fig. 1, SEMPER, Schmetterl. Philipp. ii : n. spp.
- Pygartia muricolor*, Arizona, DYAR, p. 38, J. N. York ent. Soc. vi.
- Ramesa docilis*, ♀, pl. i, fig. 18, p. 629, DUDGEON, J. Bombay Soc. xi.
- Retina rubiginosa*, China, LEECH, p. 338, Tr. ent. Soc. London, 1898, n. sp.
- Rhosus isabella*, Ecuador, DOGNIN, p. 345, Ann. Soc. ent. Belgique, xlii, n. sp.
- Rhynchopyga xanthospila*, pl. x, fig. 9, *rubricincta*, fig. 10, p. 269, Bolivia, *metaphæa*, Mexico, p. 271, HAMPSON, Cat. Syntomidæ, n. spp.
- Rifargia masta*, pl. xcii, fig. 9, *gelduba*, fig. 3, Biol. Centr.-Amer. Heter. ii.
- Rondotia lineata*, China, LEECH, p. 272, Tr. ent. Soc. London, 1898, n. sp.
- Rosema thestia*, Panama, DRUCE, p. 461, pl. xci, fig. 8, Biol. Centr.-Amer. Heter. ii, n. sp.
- Rothia panganica*, E. Africa, KARSCH, p. 330, Ent. Nachr. xxiv, n. sp.
- Sabalia*, systematic position, KARSCH, p. 289, *t. c.*
- S. tippelskirchi*, Africa, *id.* p. 293, *t. c.* n. sp.
- Sarosa xanthobasis*, Ecuador, DRUCE, p. 403, Ann. Nat. Hist. (vii) i, n. sp.
- Saturnia atlantica* var. *n. matheri*, VALLANTIN, p. 220, Bull. Soc. ent. France, 1898 : *S. pyri*, distribution in Russia, ADANSON, pp. 23–26, Feuille Natural. xxix ; habitat, altitude, ADANSON, p. 103, Feuille Natural. xxviii.
- Saturniidae* : the Philippine species, with figures of various larvæ and pupæ, SEMPER, Schmetterl. Philipp. ii.
- Saurita erythrogina*, Brazil, pl. x, fig. 5, p. 274, *sanguisecta*, Colombia, fig. 14, p. 275, *phaenicosticta*, Guatemala, fig. 17, p. 277, *bipuncta*, Brazil, pl. x, fig. 27, p. 280, HAMPSON, Cat. Syntomidæ, n. spp.
- Schizura tonac*, pl. xc, fig. 8, Biol. Centr.-Amer. Heter. ii.
- Sciathos ribbei*, Panama, DRUCE, pl. lxxxviii, fig. 1, p. 441, Biol. Centr.-Amer. Heter. ii, n. sp.
- Semyra agemytha*, pl. lxxxviii, fig. 4, characters, p. 443, *straminea*, fig. 5, DRUCE, *t. c.*
- S. ? arcuata*, pl. lxxxviii, fig. 9, Mexico, DRUCE, p. 444, *t. c.*, n. sp.
- Sesiura*, n. g., for *Eunomia smaragdina* Wlk., HAMPSON, p. 371, Cat. Syntomidæ.

- Sophta? lineata*, Key islands, WARREN, p. 424, Nov. Zool. v, n. sp.
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- Sphecosoma deceptrix*, Guatemala, p. 158, *abnormis*, Amazons, p. 159, *melanotum*, Bolivia, pl. vii, fig. 4, p. 161, HAMPSON, Cat. Syntomidæ, n. spp.
- Spilarctia puella*, Pondoland, p. 210, *vittata*, *radiosa*, *rava*, W. Africa, p. 211, DRUCE, Ann. Nat. Hist. (vii) i, n. spp.
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- Stictonacليا*, n. g. type *Nacليا anastasia*, HAMPSON, p. 125, Cat. Syntomidæ.
- Streptophlebia*, n. g. for *S. obliquistria*, n. sp., Borneo, HAMPSON, p. 52, t. c.
- Symmerista alba*, Panama, DRUCE, p. 406, pl. xci, fig. 3, Biol. Centr.-Amer. Heter. ii, n. sp.
- Syntherata dahli*, New Pomerania, WEYMER, p. 209, Ent. Nachr. xxiv, n. sp.
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- Syntomis compta*, pl. i, fig. 24, p. 293, characters, DUDGEON, J. Bombay Soc. xii.
- S. kerri*, *efulensis*, W. Africa, HOLLAND, p. 12, Ent. News Philad. 1898; *S. xanthoma*, *persimilis*, *swinhoei* with var. *obsoleta*, p. 152, *dichotoma* with var. *concurrrens*, *aucta*, *consequa*, *euryzona*, p. 153, *leucoma*, p. 154, China, LEECH, Entomologist, 1898; *S. palanana*, *sibulana*, Philippines, SEMPER, p. 419, Schmetterl. Philipp. ii; *S. graduata*, China, pl. ii, fig. 28, p. 67, *metaphæa*, N. Guinea, fig. 27, p. 68, *stenozona*, Timor, fig. 21, pl. 69, *phænicia*, fig. 23, E. Africa, *shoa*, Abyssinia, fig. 25, p. 70, *teinopera*, Borneo, p. 76, *dilaterialis*, E. Africa, pl. iii, fig. 3, pl. 82, *euryptera*, Perak, fig. 10, *kinensis*, Borneo, fig. 11, p. 87, *chrysozona*, Usambara, fig. 21, p. 90, *perixanthia*, Formosa, fig. 17, p. 97, *pentazonata*, Burma, fig. 27, p. 99, *tetrazonata*, Formosa, pl. iv, fig. 4, p. 101, *pryeri*, fig. 8, p. 102, *megista*, fig. 13, p. 107, Borneo, HAMPSON, Cat. Syntomidæ: n. spp.
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- Tarchon tanaïs*, pl. lxxxviii, fig. 6, p. 444, *corydona*, fig. 8, *lybia*, fig. 10, p. 445, Panama, DRUCE, Biol. Centr.-Amer. Heter. ii, n. spp.
- Tarsolepis kochi*, Philippines, SEMPER, p. 409, pl. lii, fig. 3, Schmetterl. Philipp. ii, n. sp.

- Tasema nox*, Cameroons, HOLLAND, p. 12, Ent. News Philad. 1898, n. sp.
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Thyrogonia, n. g. for *Syntomis efulensis* Holl., HAMPSON, p. 139, *t. c.*
Thyrosticta, n. g., type *Naclia quadrimacula* Butl., HAMPSON, p. 129, *t. c.*
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Tortricidia testacea, p. 151, pl. viii, *pallida*, p. 155, life-histories, DYAR, J. N. York ent. Soc. vi.
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Trichodesma, n. g., type *Noctua ursula* Stoll., p. 451, with *T. uniformis*, n. sp., Brazil, pl. xv, fig. 19, p. 453, HAMPSON, Cat. Syntomidæ.
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Trichromia, characters, position, DYAR, p. 38, J. N. York ent. Soc. vi.
T. neretina, Peru, DYAR, p. 37, *t. c.*, n. sp.
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Tritonaclia, n. g. for *Hydrusa kefersteini*, HAMPSON, p. 135, *t. c.*
Trogoptera sao, pl. lxxxviii, fig. 20, *rumina*, fig. 22, Biol. Centr.-Amer. Heter. ii.
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Xanthopleura, n. g., type *Calonotos trotschi* Druce, HAMPSON, p. 426, *t. c.*
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NOCTUIDÆ, CYMATOPHORIDÆ, DELTOIDÆ.

[*Cf.* BUTLER (154), DISTANT (300), DRUCE (316, 474), DYAR (329), FRENCH (411), HAMPSON (519, 520), HERZ (537), HUDSON (580), LECHNER (759), LUCAS (799), OTTOLENGUI (917), PAGENSTECHE (924), POUJADE (980), PÜNGELER (984), REUTER (1021), SCHAU (1064, 1065), SMITH (1150, 1151, 1153), SMITH & DYAR (1156), TRYON (1227), WEBSTER (1310).]

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A. chea, pl. xcv, figg. 3, 4, *darpa*, fig. 5, Mexico, DRUCE, p. 493, *t. c.*; *A. obscura*, *trilinea*, Mexico, SCHAU, p. 117, J. N. York ent. Soc. vi : n. spp.

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Amathes temperata, pl. xciv, fig. 10, Biol. Centr.-Amer. Heter. ii.

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- Baniana gobar*, pl. xcvii, fig. 8, *helicon*, fig. 9, *fulvia*, figg. 11, 12, p. 517, *B. ? ostia*, figg. 13, 14, p. 518, DRUCE, Biol. Centr.-Amer. Heter. ii ; *B. recussa*, Transvaal, DISTANT, p. 230, Ann. Nat. Hist. (vii) i ; *B. veluticollis*, St Vincent, HAMPSON, p. 251, pl. xvii, fig. 7, Tr. ent. Soc. London, 1898 : n. spp.
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- Bendis ? jonesi*, Guatemala, DRUCE, pl. xcvii, fig. 5, p. 515, Biol. Centr.-Amer. Heter. ii, n. sp.
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- B. militata*, p. 71, *metallica*, p. 72, Queensland, LUCAS, P. Soc. Queensland, xiii, n. spp.
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- Capnodes rhoda*, pl. xcvii, fig. 19, p. 521 ; *C. ? pira*, fig. 20, Biol. Centr.-Amer. Heter. ii.
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- Celæna datis*, pl. xciii, fig. 13, *lilacina*, fig. 14, Biol. Centr.-Amer. Heter. ii.
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- Chasmina alcidamea*, pl. xciii, fig. 7, p. 474, DRUCE, *t. c.*
- Chloridea distincta*, Brazil, SCHAU, p. 117, J. N. York ent. Soc. vi, n. sp.
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- Dyomyx zates*, Costa Rica, DRUCE, pl. xcvi, fig. 8, p. 500, *t. c.*, n. sp.
- D. volcanica*, Mexico, p. 119, *jonesi*, Brazil, p. 120, SCHAU, J. N. York ent. Soc. vi, n. spp.
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GEOMETRIDÆ, EPIPLEMIDÆ.

(For *Uraniidæ* see *Bombyces*.)

[*Cf.* BUTLER (154), CHRÉTIEN (207), DOGNIN (309, 310), DRUCE (313, 474), DYAR (327), HAMPSON (519), HUDSON (580), HULST (582), LOWER (797), LUCAS (799), PEYRON (945), ROTHSCHILD (1044, 1046), SCHAUS (1065), SNELLEN (1161), TUTT (1246), WAGNER (1275), WARREN (1287, 1288, 1289).]

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- Anonymia flexilinea*, Nyassa, WARREN, p. 34, Nov. Zool. v, n. sp.
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- Callidapteryx* (and *Strophiniæ*) referred to *Epiplemidæ*, which are considered the lowest Bombyces, larva of *C. dryopterata*, DYAR, pp. 155–157, Canad. Ent. xxx.
- Carphoxera ptelearia*, note on, KELLOGG, p. 15, Ent. News Philad. 1898.
- Casbia scardamiata*, Key islands, WARREN, p. 431, Nov. Zool. v, n. sp.
- Celerena signata*, Sumatra, WARREN, p. 231, *t. c.*, n. sp.
- Cenochlora*, n. g., *Geometrinæ*, for *C. felix*, n. sp., Queensland, WARREN, p. 12, *t. c.*
- Cernia*, characters, WARREN, p. 10, *t. c.*

- Chalyboclydon flexilinea*, Khasia hills, WARREN, p. 22, *t. c.*, n. sp.
Cheimatobia brumata and *boreata* in Sweden, PEYRON, Ent. Tidskr. xix, pp. 49-56.
Chloroclystis griseorufa, Sikhim, p. 78, pl. A, fig. 6, HAMPSON, J. Bombay Soc. xi; *C. nigrilineata*, Queensland, WARREN, p. 23, Nov. Zool. v; *C. seminotata*, New Guinea, WARREN, p. 245, *t. c.*; *C. dentatissima*, Key islands, WARREN, p. 428, *t. c.*; *C. antarctica*, pl. vi, fig. 20, p. 42, *maculata*, fig. 18, p. 44, *rectilineata*, fig. 22, p. 45, N. Zealand, HUDSON, N. Zeald. moths: n. spp.
Chloromiza, n. g., *Ennominae*, for *C. olivescens*, n. sp., Transvaal, WARREN, p. 36, Nov. Zool. v.
Chogada acaciaria, var. n. *inuitata*, WARREN, p. 248, *t. c.*
C. subspurcata, Niger, WARREN, p. 248, *t. c.*, n. sp.
Christophiella, n. n. for *Christophia* Staud. nec Rag., BERG, p. 17, Com. Mus. Buenos Aires, i.
Chrysocraspeda inundata, New Guinea, *rosina*, West Africa, WARREN, p. 238, Nov. Zool. v, n. spp.
Chrysolene rubripennis, *sanguinolenta*, W. Africa, WARREN, p. 238, *t. c.*, n. spp.
Cidaria sociata, varr., BROWN, p. 33, Bull. Soc. ent. France, 1898; *C. sagittata*, egg and larva, FRYER, p. 76, Ent. Mag. 1898.
Cleora trisinuata, New Guinea, WARREN, p. 248, Nov. Zool. v; *C. subaustralis*, *pedicellata*, Florida, HULST, p. 194, Canad. Ent. xxx: n. spp.
Cænina aurivena, E. Africa, BUTLER, p. 433, P. Zool. Soc. London, 1898, n. sp.
Comibæna delacruz, Ecuador, DOGNIN, p. 218, Ann. Soc. ent. Belgique, xlii, n. sp.
Coreura hampsoni, Ecuador, DOGNIN, p. 212, *t. c.*, n. sp.
Corotia? *ambigua*, Penang, WARREN, p. 253, Nov. Zool. v, n. sp.
Cosymbia? *irregularis*, Niger, WARREN, p. 239, *t. c.*, n. sp.
Craspedia subperlaria and *sufficiens* are one, WARREN, p. 241, *t. c.*; *C.* (sub *Acidalia*) *parasira* Meyr. = (*discata* Warr.), WARREN, p. 432, *t. c.*
C. calorifica, Bali, *circumpunctata*, Transvaal, p. 17, *coundularia*, *C.*? *eximia*, *C. fumigrisea*, Sumba, p. 18, *pallidiceps*, Lombok, *parumnotata*, Java, *sublobata*, Transvaal, p. 19, WARREN, *t. c.*; *C. bispurcata*, Khasia hills, *flavissima*, p. 239, *haemaleata*, *pyraliata*, Niger, *semispurcata*, New Guinea, p. 240, *C.*? *submarginata*, *C. transsecta*, p. 241, Niger, WARREN, *t. c.*: n. spp.
Craspedosis castellata, *galathea*, New Guinea, WARREN, p. 33, *t. c.*, n. spp.
Cratoptera illecta, Panama, DRUCE, p. 529, pl. xcviii, fig. 7, Biol. Centr.-Amer. Heter. ii, n. sp.
Dasimatia, n. g., near *Chloroclystis* for *D. subusta*, n. sp., Celebes, WARREN, p. 24, Nov. Zool. v.
Deilinia behrensaria, var. n. *cervinicolor*, HULST, p. 161, Canad. Ent. xxx.
D. pulveraria, Brit. Columbia, HULST, p. 161, *t. c.*, n. sp.
Diactinia, n. g., *Hydriomeninae* for *D. leucoglyphica*, n. sp., Khasia hills, WARREN, p. 27, Nov. Zool. v.
Diastictis anomalata = (*Halia adzearia* Oberth.), SNELLEN, p. 113, Tijdschr. Ent. 113.
D. particolor, p. 163, *maricopa*, *floridensis*, *ovalis*, p. 164, *benigna*, *sericeata*, p. 191, N. America, HULST, Canad. Ent. xxx, n. spp.
Dirades albula, *decorata*, Queensland, WARREN, p. 228, Nov. Zool. v, n. spp.
Diradopsis, n. g., near *Dirades* for *D. perfallax*, n. sp., Key islands, WARREN, p. 425, *t. c.*
Dysethiodes quadripuncta, Khasia hills, WARREN, p. 21, *t. c.*, n. sp.
Dysschema, n. g., *Dysphaniinae* for *D. goniata*, n. sp., New Guinea, WARREN, p. 10, *t. c.*

- Elphos hypocallistis*, Queensland, LOWER, p. 44, P. Linn. Soc. N. S. Wales, xxiii, n. sp.
- Emmesura*, n. g., *Sterrhinae*, type *Anisodes semicompleta* Wlk., WARREN, p. 20, Nov. Zool. v.
- Ennomos ochreatus*, California, HULST, p. 218, Canad. Ent. xxx, n. sp.
- Eois persimilis*, *hanhami*, Canada, HULST, p. 158, *t. c.*, n. spp.
- Ephyra obscura*, Mexico, DRUCE, pl. xcix, fig. 6, p. 536, Biol. Centr.-Amer. Heter. ii, n. sp.
- Epiplema bicaudata* = (*fuscifrons* Warr.), HAMPSON, p. 710, J. Bombay Soc. xi.
- E. inelegans*, Niger, WARREN, p. 229, Nov. Zool. v; *E. illiturata*, Natal, WARREN, p. 9, *t. c.*; *E. retracta*, Sikhim, HAMPSON, p. 709, J. Bombay Soc. xi : n. spp.
- Episothalma excavata*, Niger, WARREN, p. 234, Nov. Zool. v, n. sp.
- Ersephila indistincta*, N. America, HULST, p. 119, Canad. Ent. xxx, n. sp.
- Euchloris* ? *tetralopha*, Queensland, LOWER, p. 43, P. Linn. Soc. N. S. Wales, xxiii, n. sp.
- Eucymatoge gillettei*, Colorado, HULST, p. 116, Canad. Ent. xxx, n. sp.
- Eudule hyalina*, Arizona, HULST, p. 114, *t. c.*, n. sp.
- Eugonobapta constans*, Arizona, HULST, p. 216, *t. c.*, n. sp.
- Eulygdia*, n. g., type *Tephrosia tidzinaria* Oberth., WARREN, p. 32, Nov. Zool. v.
- Euphronarcha*, n. g., type *luxaria* Gn., WARREN, p. 249, *t. c.*
- Eurythecodes* = (*Trisyndeta* Warr.) and *E. flavedinaria* = (*T. subspersa* Warr. and *Metanema molliaria* Guen.), WARREN, p. 37, *t. c.*
- E. impunctata*, Uganda, WARREN, *t. c.*, n. sp.
- Evarzia nana*, Niger, WARREN, p. 250, *t. c.*, n. sp.
- Fascellina papuensis*, New Guinea, p. 37, *punctata*, Khasia hills, p. 38, WARREN, *t. c.*, n. spp.
- Gastrinodes*, n. g., type *biteniaria* Le Guill., WARREN, p. 249, *t. c.*
- Gathynia despecta*, Queensland, WARREN, p. 229, *t. c.*, n. sp.
- Gelasma albidata*, pl. xcix, fig. 3, Biol. Centr.-Amer. Heter. ii.
- G. fuscipuncta*, Madagascar, WARREN, p. 13, Nov. Zool. v, n. sp.
- Geometra xaliria*, p. 212, *tutala*, *liriata*, *latuta*, p. 213, *diarita*, *igualala*, *pasama*, p. 214, *acora*, *licada*, p. 215, *calida*, p. 216, Ecuador, DOGNIN, Ann. Soc. ent. Belgique, xlii, n. spp.
- Gonodela conturbata*, Niger, WARREN, p. 251, Nov. Zool. v, n. sp.
- Graphipidus*, cf. *Bombyces*, p. 212.
- Gymnoscelis subrufata*, Queensland, WARREN, p. 24, *t. c.*; *G. inops*, *nigrescens*, Key Islands, WARREN, p. 428, *t. c.* : n. spp.
- Hameopis*, n. g., near *Zamagra*, for *H. rudicornis*, pl. xxxii, fig. 13, n. sp., E. Africa, BUTLER, p. 435, P. Zool. Soc. London, 1898.
- Hydriomena pernotata*, p. 117, *occidens*, *grandiosa*, p. 118, North America, HULST, Canad. Ent. xxx, n. spp.
- Hypographa reflua*, Queensland, LUCAS, p. 70, P. Soc. Queensland, xiii, n. sp.
- Hypochroma conspurcata*, Queensland, LUCAS, p. 68, *t. c.*, n. sp.
- Heterostegane insulata*, Key Islands, WARREN, p. 429, Nov. Zool. v, n. sp.
- Hyposidra lactemaculata*, Mindoro, WARREN, p. 254, *t. c.*, n. sp.
- Hypephyra triangulifera*, Sumba, WARREN, p. 251, *t. c.*, n. sp.
- Hemerophila aborta*, Uganda, WARREN, p. 247, *t. c.*, n. sp.
- Heterorachis*, n. g. for *Geometra devocata* Walk. WARREN, p. 235, *t. c.*
- Hemithea bella*, Flores, WARREN, p. 234, *t. c.*, n. sp.
- Hyperythra lutea rubricata* subsp. n., WARREN, p. 35, *t. c.*
- Hybridoneura*, n. g., p. 24, near *Chloroclystis*, for *H. abnormis*, n. sp., Khasia hills, p. 25, WARREN, *t. c.*
- Iodis lechera*, Ecuador, DOGNIN, p. 216, Ann. Soc. ent. Belgique, xlii; *I. sideralis*, Queensland, LUCAS, p. 68, P. Soc. Queensland, xiii; *I.*

- spumifera*, Penang, WARREN, p. 235, Nov. Zool. v; *I. albipuncta*, Khasia hills, WARREN, p. 13, *t. c.* : n. spp.
- Ischnopteryx joya*, Ecuador, DOGNIN, p. 346, Ann. Soc. ent. Belgique, xlii, n. sp.
- Jubarella*, n. g., for *J. danbyi*, n. sp., British Columbia, HULST, p. 192, Canad. Ent. xxx.
- Leptomeris nigrodiscalis*, Maine, HULST, p. 158, Canad. Ent. xxx, n. sp.
- Leptostegna tenerata* = (*Dyspteris asiatica* Warr.), SNELLEN, p. 114, Tijdschr. Ent. xli.
- Leucania impura*, egg, oviposition, young larva, LECHNER, p. 104, Tijdschr. Ent. xli.
- Lozogamma* ? *setaria*, Parana, SCHAUS, p. 146, J. N. York ent. Soc. vi, n. sp.
- Loxographie*, n. g. for *L. fulva*, n. sp., Brisbane, WARREN, p. 252, Nov. Zool. v.
- Lipopyga*, n. g., type *Larentia exprimataria* Wlk., WARREN, p. 249, *t. c.*
- Lycimna timareta*, Panama, DRUCE, p. 527, pl. xeviii, fig. 3, Biol. Centr.-Amer. Heter. ii.
- Macaria pictipennata*, Arizona, HULST, p. 162, Canad. Ent. xxx, n. sp.
- Marmarea peplarioides*, North America, HULST, p. 218, *t. c.*, n. sp.
- Mesoleuca abacta*, Arizona, HULST, p. 117, *t. c.*, n. sp.
- Metallochloa* (sub. *Iodis*) *militaris* Luc. = (*dotata* Warr.), WARREN, p. 432, Nov. Zool. v.
- M. sanguinipuncta*, Key Islands, WARREN, p. 425, *t. c.*, n. sp.
- Metanema subpunctata*, California, HULST, p. 218, Canad. Ent. xxx, n. sp.
- Microgonia gilva, fulcata*, Parana, SCHAUS, p. 146, J. N. York ent. Soc. vi, n. spp.
- Milona regina* is same as *M. rawakensis woodlarkiana*, ROTHSCILD, p. 102, Nov. Zool. v; *M. callimorpha*, var. n., ROTHSCILD, p. 219, *t. c.*
- M. obiensis*, Obi, ROTHSCILD, p. 417, *t. c.*, n. sp.
- Mixochroa*, n. g., type *Nemoria gratiosata* Guen., WARREN, p. 13, Nov. Zool. v.
- Monobolodes*, n. g., p. 229, *Epiplemidæ*, for *M. subfalcata*, n. sp., Queensland, WARREN, p. 230, *t. c.*
- Monoctenia obtusata* referred to *Arhodia*, WARREN, p. 9, *t. c.*
- M. pallidula*, Queensland, LUCAS, p. 69, P. Soc. Queensland, xiii, n. sp.
- Monotaxis*, n. g., *Hydriomenides*, for *M. semipectinata*, n. sp., Arizona, HULST, p. 120, Canad. Ent. xxx.
- Mycterophora slossoniæ*, N. America, HULST, p. 120, *t. c.*, n. sp.
- Nacophora quernaria*, var. n. *atrescens*, HULST, p. 162, *t. c.*
- Nadagarodes turpis*, var. n. *quadrinaculata*, WARREN, p. 252, Nov. Zool. v.
- Nemoria unilinea*, amended characters, WARREN, p. 235, *t. c.*
- N. ? unifasciata*, Mexico, DRUCE, pl. xcix, fig. 1, p. 535, Biol. Centr.-Amer. Heter. ii; *N. chaga*, Ecuador, DOGNIN, p. 216, Ann. Soc. ent. Belgique, xlii : n. spp.
- Neogyne*, n. g., *Ennominae*, for *N. elongata*, n. sp., Queensland, WARREN, p. 256, Nov. Zool. v.
- Neoterpes ephelidaria* var. n. *kunzei*, HULST, p. 215, Canad. Ent. xxx.
- Nipteria mundaoides*, p. 346, *hija, folia*, p. 347, *perezi, leluxia, tiza*, p. 348, Ecuador, DOGNIN, Ann. Soc. ent. Belgique, xlii, n. spp.
- Notoreas simplex*, N. Zealand, p. 74, pl. viii, fig. 26, HUDSON, N. Zeald. moths, n. sp.
- Enochroma leucospila*, p. 230, *pallida*, p. 231, Queensland, WARREN, Nov. Zool. v, n. spp.
- Enospila flavitania*, Niger, WARREN, p. 13, *t. c.*; *Æ. rubricorpus*, Niger, WARREN, p. 235, *t. c.* : n. spp.
- Onychodes fulgurans*, Queensland, LUCAS, p. 70, P. Soc. Queensland, xiii, n. sp.

- Oospila pulveriplaga*, Niger, WARREN, p. 14, Nov. Zool. v, n. sp.
Ophthalmophora fasciata, Parana, SCHAUS, p. 145, J. N. York ent. Soc. vi, n. sp.
Orthonama semiflava, Transvaal, WARREN, p. 28, Nov. Zool. v, n. sp.
Oxychora, n. g., *Geometrinæ*, for *O. tenuis*, n. sp., Buru, WARREN, p. 236, t. c.
Oxycophina (sub *Siculodes*) *theorina* Meyr. = (*subfenestrata* Warr.), WARREN, p. 432, t. c.
Oxydia apidania, pl. xcvi, fig. 4, *medona*, fig. 5, Biol. Centr.-Amer. Heter. ii.
O. unicolor, Costa Rica, DRUCE, pl. xcvi, fig. 6, p. 528, t. c., n. sp.
Palæaspilates, characters, WARREN, p. 10, Nov. Zool. v.
Paleacrita longiciliata, *speciosa*, N. America, HULST, p. 113, Canad. Ent. xxx, n. spp.
Paradirades fulvilunata, New Guinea, WARREN, p. 230, Nov. Zool. v, n. sp.
Paradromulia anomala, New Guinea, WARREN, p. 34, t. c., n. sp.
Paragonia maculata, pl. xcvi, fig. 2, Biol. Centr.-Amer. Heter. ii.
Parathemis, n. g., type *lyciaria* Gn., p. 250, with *P. irrorata* = (*Selidosema canescaria* Meyr.), *violescens*, n. spp., Queensland, p. 251, WARREN, Nov. Zool. v.
Pareuchloris apicata, Natal, WARREN, p. 14, t. c., n. sp.
Parrhesia philyroides, *vidra*, Ecuador, DOGNIN, p. 349, Ann. Soc. ent. Belgique, xli, n. spp.
Pasiphilodes maculilinea, Key Islands, WARREN, p. 429, Nov. Zool. v, n. sp.
Perissolophia subsimilis, Sikkim, WARREN, p. 232, t. c., n. sp.
Perixera cretacea, Woodlark Island, WARREN, p. 20, t. c.; *P. ? rubrisecta*, Key Islands, WARREN, p. 426, t. c.; *P. leucopelta*, Queensland, LOWER, p. 42, P. Linn. Soc. N. S. Wales, xxiii : n. spp.
Perizoma rectilineata, New Guinea, WARREN, p. 246, Nov. Zool. v, n. sp.
Phasiane clathrata, var. n. *nocturnata*, FUCHS, p. 207, Jahrb. Nassau. Ver. li.
Phengommataea dissimilis, Colorado, HULST, p. 215, Canad. Ent. xxx, n. sp.
Photoscotosia multiplicata, Java, WARREN, p. 28, Nov. Zool. v, n. sp.
Phrudochorda, n. g., *Ennominae*, p. 254, for *P. fuscimargo*, n. sp., Natal, p. 255, WARREN, t. c.
Physocleora tascaria, p. 147, *obscura*, *punctilla*, p. 148, Parana, SCHAUS, J. N. York ent. Soc. vi, n. spp.
Pisoraca ? inornata, Niger, WARREN, p. 241, Nov. Zool. v; *P. compacta*, p. 426, *P. ? grisea*, p. 427, Key Islands, WARREN, t. c. : n. spp.
Pityeja picta, Mexico, SCHAUS, p. 145, J. N. York ent. Soc. vi, n. sp.
Pleionocentra, n. g., *Sterrhinae*, type *minorata* Boisd., WARREN, p. 242, Nov. Zool. v.
Plesiomorpha, n. g., p. 38, *Ennominae*, for *P. vulpecula*, n. sp., Khasia hills, p. 39, WARREN, t. c.
Plutodes discigera, pl. i, fig. 8, *flavescens*, fig. 9, characters, SNELLEN, Tijdschr. Ent. xli.
P. maturaria, Assam, p. 33, pl. i, figg. 10, 11, *id.* t. c., n. sp.
Polyphasia cuneifera, Java, WARREN, p. 29, Nov. Zool. v, n. sp.
Pomasia vernacularia Gn., characters, WARREN, p. 245, t. c.
Potera viduata, New Guinea, WARREN, p. 32, t. c., n. sp.
Presos angelus, New Guinea, ROTHSCILD, p. 102, t. c., n. sp.
Prionia hematopsis, Buru, *rufipennis*, Sibutu, WARREN, p. 255, t. c., n. spp.
Probolosceles albipunctata, *connata*, Queensland, *P. ? esmeralda*, Niger, WARREN, p. 15, t. c., n. spp.
Prochasma minima Warr., referred to *Boarmia* and renamed *B. flavisecta*, HAMPSON, p. 724, J. Bombay Soc. xi.

- Procypha conformis*, Niger, WARREN, p. 39, Nov. Zool. v, n. sp.
Pseudasthena discata, Borneo, WARREN, p. 22, t. c., n. sp.
Pseudomiza fulvata, Khasia hills, WARREN, p. 40, t. c., n. sp.
Pseudoterpna percomptaria, peculiar larva, RAINBOW, p. 81, pl. xviii, Rec. Austral. Mus. iii.
P. castanea, N. S. Wales, LOWER, p. 45, P. Linn. Soc. N. S. Wales, xiii, n. sp.
Psilocambogia ingrataria, Khasia hills, WARREN, p. 23, Nov. Zool. v, n. sp.
Psilocladia, n. g., *Ennominae*, for *P. obliquata*, n. sp., Natal, WARREN, p. 40, t. c.
Psilopora thesea, Parana, SCHAUS, p. 147, J. N. York ent. Soc. vi, n. sp.
Psodus noricana, Austrian Alps, WAGNER, p. 715, Verh. Ges. Wien, 1898, n. sp.
Ptychophyle hilaris, Niger, WARREN, p. 242, Nov. Zool. v, n. sp.
Ptychopoda mundipennis, Madagascar, *pilosata*, Queensland, WARREN, p. 21, t. c.; *P. æquisinuata*, Khasia hills, p. 242, *inobtrusa*, *submaculata*, Niger, *scintillans*, Queensland, p. 243, WARREN, t. c. : n. spp.
Racheospila splendens, Mexico, DRUCE, pl. xcix, fig. 4, p. 535, Biol. Centr.-Amer. Heter. ii; *R. jenna*, p. 216, *pomposa*, *kena*, p. 217, *alada*, p. 218, Ecuador, DOGNIN, Ann. Soc. ent. Belgique, xlii : n. spp.
Rhinoprora pallidiplaga, Queensland, p. 25, *rufitincta*, Java, p. 26, WARREN, Nov. Zool. v, n. spp.
Rhomborista palliata, Niger, WARREN, p. 16, t. c.; *R. ustipennis*, Niger, WARREN, p. 236, t. c. : n. spp.
Ripula vestalis, Florida, HULST, p. 215, Canad. Ent. xxx, n. sp.
Sciagraphia spodoptera, Colorado, p. 162, *flavivenata*, Quebec, p. 163, HULST, Canad. Ent. xxx, n. spp.
Selidosema lachrymosa, p. 194, *configurata*, p. 195, North America, *nigrescens*, Texas, p. 214, HULST, t. c.; *S. humillima*, N. Zealand, HUDSON, p. 83, pl. ix, fig. 5, N. Zealand. moths : n. spp.
Semiothisa albidulata, Sumba, WARREN, p. 252, Nov. Zool. v; *S. oaxacana*, Mexico, SCHAUS, p. 146, J. N. York ent. Soc. vi : n. spp.
Sicya ? *hepburni*, pl. xviii, fig. 12, p. 529, *sirra*, fig. 13, p. 530, Mexico, DRUCE, Biol. Centr.-Amer. Heter. ii : n. spp.
Slossonia, n. g., p. 216, for *S. rubrotincta*, California, *latipennis*, Florida, n. spp., p. 217, HULST, Canad. Ent. xxx.
Somatina maculata, *sordida*, Queensland, *ossicolor*, Sumba, WARREN, p. 244, Nov. Zool. v, n. spp.
Spodoptera kunzei, Arizona, HULST, p. 192, Canad. Ent. xxx, n. sp.
Stenalcidia nortonia, *cindica*, Parana, SCHAUS, p. 148, J. N. York ent. Soc. vi, n. spp.
Stenaspilates inviolata, Arizona, HULST, p. 218, Canad. Ent. xxx, n. sp.
Stenoteras, n. g. for *Stibaroma trigramma* Lower, WARREN, p. 257, Nov. Zool. v.
Sterictopsis, n. g., *Ennominae*, for *S. inconsequens*, n. sp., Queensland, WARREN, p. 257, t. c.
Synaxis fuscata, Colorado, HULST, p. 218, Canad. Ent. xxx, n. sp.
Synchlora louisa, *viridipurpurea*, Florida, p. 159, *texana*, Austin, HULST, p. 160, t. c., n. spp.
Syndromodes cellulata, Transvaal, *tenuis*, Niger, WARREN, p. 16, Nov. Zool. v, n. spp.
Synelys nigrocandida, Florida, HULST, p. 121, Canad. Ent. xxx, n. sp.
Tasta micaceata = (*chalybeata* Warr.), HAMPSON, p. 713, J. Bombay Soc. xi.
Tephрина bilineata, Transvaal, WARREN, p. 35, Nov. Zool. v; *T. ansorgei*, Uganda, WARREN, p. 253, t. c.; *T. submarcata*, *griseata*, *guadarana*, Mexico, SCHAUS, p. 149, J. N. York ent. Soc. vi : n. spp.
Tephrinopsis plana, Queensland, WARREN, p. 253, Nov. Zool. v, n. sp.

- Tephroclystia nexilinea*, Khasia hills, WARREN, p. 26, Nov. Zool. v, n. sp.
Tephroclystis borealis, *latipennis*, *subcolorata*, p. 114, *niveifascia*, *acutipennis*, p. 115, *perfusca*, p. 116, N. America, HULST, Canad. Ent. xxx, n. spp.
Tephronia cebennaria, Ardèche, CHRÉTIEN, p. 20, Bull. Soc. ent. France, 1898, n. sp.
Tephrosia bistortata and *crepuscularia*, hybrids resulting from, TUTT, Tr. ent. Soc. London, 1897, pp. 17–42; characters, Ent. Rec. x, p. 32; numerous notes on, in Ent. Rec. x.
T. ? lineata, Guatemala, DRUCE, pl. xcix, fig. 2, p. 534, Biol. Centr.-Amer. Heter. ii, n. sp.
Tetracis azonax=(*rivulata* Warr.), DRUCE, p. 530, *t. c.*
Terpna rubroviridata, Penang, WARREN, p. 232, Nov. Zool. v, n. sp.
Thalassodes nigripunctata, characters, WARREN, p. 237, *t. c.*
T. opaca, Niger, WARREN, p. 17, *t. c.*, n. sp.
Thalera oblongata, Niger, WARREN, p. 17, Nov. Zool. v; *T. dalica*, Ecuador, DOGNIN, p. 218, Ann. Soc. ent. Belgique, xlii : n. spp.
Therina punctata, Colorado, HULST, p. 215, Canad. Ent. xxx, n. sp.
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PYRALIDÆ, s. l. (incl. THYRIDIDÆ).

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TINEIDÆ.

[Cf. BANKES (49), BUTLER (154), CHAPMAN (199), CHRÉTIEN (208, 209, 210), COCKERELL (217), FUCHS (434), GIARD, (463), GUERCIO (512), HOFMANN (542, 544), HÖFNER (546), ILLIDGE (592), JOANNIS (618), KLEMENSIEWICZ (680), LOWER (797), LUCAS (799), MATSUMURA (832), SAHLBERG (1054), SCHÜTZE (1091), SEEBOLD (1103, 1104), SORHAGEN (1164), SPULER (1173, 1174), STEDMAN (1179), THEOBALD (1207), TURNER (1245), WALSINGHAM (1278, 1280, 1281), WALSINGHAM & DURRANT (1282).]

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Threnia microtelus, p. 147, pl. v, figg. 10, 11, *acanthura*, p. 149, figg. 12, 13, Java, WULP, Tijdschr. Ent. xli, n. spp.

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Thereva: inconsistency of nervuration, ROSELLE (1040).

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Leptis cavannæ, p. 28, *chrysopilæformis*, p. 31, Italy, BEZZI, Bull. Soc. ent. Ital. xxx ; *L. flavimedia*, Japan, COQUILLET, p. 307, P. U. S. Mus. xxi : n. spp.

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- G. montanus*, N. America, *id. l. c.*, n. sp.
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- H. rubida*, Japan, COQUILLETT, p. 336, P. U. S. Mus. xxi, n. sp.
- Hemilea novakii*, ♀, MIK, p. 166, Wien. ent. Zeit. xvii.
- Hexamitocera vittata*, N. America, COQUILLETT, p. 165, J. N. York ent. Soc. vi, n. sp.
- Hippelates*=(*Opetiophora*), COQUILLETT, p. 44, t. c.
- H. capax*, *bicolor*, N. America, COQUILLETT, p. 48, t. c., n. spp.
- Icteroptera*, n. g., p. 212, *Ortalinæ*, for *I. limbipennis*, Java, *maculata*, Nias, n. spp., p. 213, WULP, Tijdschr. Ent. xli.
- Lauxania latipennis*, p. 279, *facialis*, *albiseta*, p. 280, N. America, COQUILLETT, Canad. Ent. xxx, n. spp.
- Limosina tenebrarum*, caves in Indiana, ALDRICH, p. 190, Rep. Geol. Indiana, xxi; *L. thalhammeri*, Styria, STROBL, p. 276, Mt. Ver. Steiermark, xxxiv : n. spp.
- Lipochæta texensis*, Padre island, TOWNSEND, p. 168, Ent. News Philad. 1898, n. sp.
- Loriomyia*, n. g., *Ortalidæ* near *Cleitamia*, for *L. guttipennis*, n. sp., New Guinea, KERTÉSZ, Ann. Mus. Genova, xxxix.
- Monocera*, n. g., *Drosophilinæ*, for *M. monstrosa*, n. sp., New Guinea, WULP, p. 425, pl. xx, fig. 8, Termes. Fuzetek, xxi.
- Mosillus*=(*Gymnopa*), COQUILLETT, p. 45, J. N. York ent. Soc. vi.
- Naupoda ypsilon*, Java, WULP, p. 206, pl. x, fig. 2, Tijdschr. Ent. xli, n. sp.
- Nerius femoratus*, Japan, COQUILLETT, p. 336, P. U. S. Mus. xxi, n. sp.
- Opsiomysia*, n. g., *Scatophagidæ* for *O. palpalis*, n. sp., N. America, COQUILLETT, p. 162, J. N. York ent. Soc. vi.
- Orygma luctuosa*, larva and imago described, KIEFFER, p. 102, Ann. Soc. ent. France, lxvii.
- Oscinidæ* : table of N. American genera, COQUILLETT, p. 45, J. N. York ent. Soc. vi.

- Oscinis haplegoides*, p. 262, *styriaca*, p. 263, Styria, STROBL, Mt. Ver. Steiermark, xxxiv; *O. virgata*, *pectoralis*, N. America, COQUILLET, p. 49, J. N. York ent. Soc. vi : n. spp.
- Pachycerina clavipennis*, Florida, COQUILLET, p. 280, Canad. Ent. xxx, n. sp.
- Phytomyza* and *Agromyza*, mines described and figured, SCHRÖDER, pp. 1-3, Illustr. Zeitschr. Ent. iii.
- P. anteposita*, Styria, STROBL, p. 275, Mt. Ver. Steiermark, xxxiv, n. sp.
- Psila quadrilineata*, Styria, STROBL, p. 260, *t. c.*, n. sp.
- Ptilona modesta*, characters, WULP, p. 219, Tijdschr. Ent. xli.
- Pyrgota lugens*, Guatemala, WULP, pl. x, fig. 1, p. 378, Biol. Centr.-Amer. Dipt. ii, n. sp.
- Rhagoletis cerasi*, natural history, larval food-habits, MIK, pp. 279-288, pl. iv, Wien. ent. Zeit. xvii.
- R. ribicola*, N. America, DOANE, p. 69, Ent. News Philad. 1898, n. sp.
- Rhopalomera* sp., pl. x, fig. 3, variation, p. 379, WULP, Biol. Centr.-Amer. Dipt. ii.
- Rioxa lanceolata*, characters, WULP, p. 218, Tijdschr. Ent. xli.
- Rivellia occulta*, pl. x, fig. 8, *submetallica*, fig. 10, p. 382, *connecta*, fig. 12, *flexuosa*, fig. 13, p. 383, *pilosula*, fig. 14, *longicornis*, fig. 15, p. 384, Central America, WULP, Biol. Centr.-Amer. Dipt. ii, n. spp.
- Sapromyza euaesta*, Japan, COQUILLET, p. 340, P. U. S. Mus. xxi; *S. hubbardii*, *sheldoni*, *houghii*, p. 277, *slossonæ*, *livingstoni*, *creveceuri*, *brachysoma*, p. 278, *flaveola*, *magna*, p. 279, N. America, COQUILLET, Canad. Ent. xxx : n. spp.
- Scatophagidæ*, table of N. American genera, COQUILLET, p. 161, J. N. York ent. Soc. vi.
- Scatophaga mellipes*, Japan, COQUILLET, p. 335, P. U. S. Mus. xxi; *S. vulpina*, Alaska, COQUILLET, p. 162, J. N. York ent. Soc. vi : n. spp.
- Sepsis costalis*, Somaliland, JOHNSON, p. 163, P. Ac. Philad. 1898, n. sp.
- Sigaloessa flaveola*, N. America, COQUILLET, p. 49, J. N. York ent. Soc. vi, n. sp.
- Siphonella inquilina*, Virginia, COQUILLET, p. 48, *t. c.*, n. sp.
- Stegana stroblii*, Transsylvania, MIK, p. 216, Wien. ent. Zeit. xvii, n. sp.
- Stenopterina geniculata*, p. 206, *rufifemorata*, p. 207, Java, WULP, Tijdschr. Ent. xli; *S. alligata*, Mexico, WULP, p. 381, pl. x, fig. 7, Biol. Centr.-Amer. Dipt. ii : n. spp.
- Stictomyia longicornis*, pl. x, fig. 5, p. 380, Biol. Centr.-Amer. Dipt. ii.
- Toxotrypana curvicauda*, pl. x, fig. 2, p. 379, Biol. Centr.-Amer. Dipt. ii.
- Trigonometopus punctipennis*, Colorado, COQUILLET, p. 280, Canad. Ent. xxx, n. sp.
- Trypeta stellata* and *Carphotricha pupillata*, synonymic note, MIK, p. 62, Wien. ent. Zeit. xvii.
- T. vibrissata*, Japan, COQUILLET, p. 338, P. U. S. Mus. xxi, n. sp.
- Tephritis punctigera*, Japan, COQUILLET, p. 338, *t. c.*, n. sp.
- Xarnuta leucotelus*, characters, WULP, p. 215, pl. x, fig. 13, Tijdschr. Ent. xli.
- Xiria*, referred to *Ortalinae*, characters of species, WULP, pp. 208-210, *t. c.*
- X. lavinia*, Java, pl. x, figg. 8, 9, p. 210, *id. t. c.*, n. sp.

APHANIPTERA (SIPHONAPTERA).

[Cf. BAKER (47), DAHL (286), N. C. ROTHSCHILD (1042, 1043), WANDOLLECK (1284).]

Anatomy and morphology of skeleton, N. C. ROTHSCHILD, Nov. Zool. v, pp. 533-538.

Relations of *Siphonaptera* and *Diptera*, morphology of trophi, DAHL, SB. Ges. naturfr. Berlin, 1898, pp. 185–199.

The supposed relation of *Puliciphora* with *Aphaniptera*, WANDOLLECK, Zool. Anz. 1898, p. 180.

Megapsyllidæ, nov. fam. for *Megapsylla* n. g., for *Pulex grossiventris* Wegenb., BAKER, p. 53, J. N. York ent. Soc. vi.

Ceratopsylla elongatus, characters, p. 542, variation in combs, p. 543, figures, pl. xvi, figg. 6, 8, 10, *C. octactenus* figures, 7, 9, N. C. ROTHCHILD, Nov. Zool. v.

C intermedius, England, *id. t. c.*, p. 543, n. sp.

Pulex divisus, n. n. for *longispinus* Bak. nec Wagner, BAKER, p. 54, J. N. York ent. Soc. vi.

P. multispinosus, p. 54, *arizonensis*, p. 55, North America, BAKER, *t. c.*, n. spp.

Stephanocircus mars, Argentina, N. C. ROTHCHILD, p. 544, pl. xvi, fig. 11, Nov. Zool. v, n. sp.

Typhlopsylla agyrtes subsp. n. *nobilis*, pp. 538, 539, pl. xv A, *dasytnemus*, p. 540, figg. 4, 5, *pentacanthus*, p. 541, fig. 3, described and figured, N. C. ROTHCHILD, *t. c.*

T. nudata, *charlottensis*, N. America, BAKER, p. 56, J. N. York ent. Soc. vi, n. spp.

(E.) RHYNCHOTA OR HEMIPTERA.

Morphology of mouth-parts, SMITH (1149).

Spermatogenesis, MONTGOMERY (873).

List of the *Hemiptera* of Hungary, HORVÁTH (563).

Hemiptera of New Zealand, HUTTON (587).

Diptera parasitic in *Hemiptera*, MIK, p. 165, Wien. ent. Zeit. xvii.

Fossil *Hemiptera*, MEUNIER (850).

HEMIPTERA-HETEROPTERA.

[The titles indicated by the following names and numbers refer to *Hemiptera-Heteroptera*, viz.:—BERG (65), BERGROTH (70 to 76), BERLESE (79), BIANCHI (91), BREDDIN (138, 139), CARPENTER (185), CHAMPION (198, 474), DISTANT (302, 303), DUGGAR (321), FORBES (401), HANDLIRSCH (524, 525), HORVÁTH (558 to 563), HÜEBER (581), HUTTON (587, 588), JONCK (624), KIRKALDY (671 to 676), KIRKLAND (677), KULWETZ (735, 737, 738), MARTIN (825, 826), MONTANDON (865 to 872), MONTGOMERY (873), NOUALHIER (892), PAULMIER (930), PUTON (985, 986), REUTER (1022, 1023), RIBAGA (1025), SNOW (1163), SPEISER (1169), STEINHEIL (1184), UHLER (1252 to 1256), WEBSTER (1309).]

Stink-glands, KULWETZ (735), function etc., KULWETZ (737), position, development etc., KULWETZ, Zool. Anz. pp. 67-69.

For many synonymical remarks on palearctic species, not reproduced below, cf. HORVÁTH, pp. 275-281, Rev. Ent. franc. xvii.

New bat-parasite; see p. 262, *Polycetenidæ*.

Peculiar structure in connection with sexual glands in *Cimex*, RIBAGA (1025), BERLESE (79).

PENTATOMIDÆ.

Pentatomidæ of South and Central Africa, DISTANT, Ann. Nat. Hist. (vii) ii, pp. 294-316.

Æliomorpha scutellata, Transvaal, DISTANT, p. 300, *t. c.*, n. sp.

Aspavia carbula, Nyasaland, DISTANT, p. 313, *t. c.*, n. sp.

Aspongopus lividus, Nyasaland, DISTANT, p. 315, *t. c.*, n. sp.

Basicryptus projectus, Transvaal, DISTANT, p. 303, *t. c.*, n. sp.

Cænomorpha splendidula, Nyasaland, DISTANT, p. 311, *t. c.*, n. sp.

Carpocoris nigricornis = (*fuscispinus* Boh.), PUTON, p. 176, Rev. Ent. franc. xvii.

Chipatula n.g. near *Cænomorpha*, for *C. typica* n. sp. Nyasaland, DISTANT, p. 312, Ann. Nat. Hist. (vii) ii.

Cocalus leucogrammus = (*Sciocoris clausus* Wlk.), DISTANT, p. 316, *t. c.*

Coptosoma putoni, Syria, MONTANDON, p. 206, Bull. Soc. Bucarest, vii; *C. bottegori*, p. 551, *alienum*, p. 552, Somaliland, MONTANDON, Ann. Mus. Genova, xxxix : n. spp.

- Crocistethus basalis*, a distinct species, HORVÁTH, p. 148, Rev. Ent. franc. xvii.
- Dalsira alata*, p. 302, *crassa*, *maura*, p. 303, Transvaal, DISTANT, Ann. Nat. Hist. (vii) ii, n. spp.
- Deroplax circumducta* = (*Hotea picea* Wlk.), DISTANT, p. 316, *t. c.*
- D. nigrofasciata*, Nyasaland, DISTANT, p. 310, *t. c.*, n. sp.
- Dichelorhinus rustenburgi*, Transvaal, DISTANT, p. 304, *t. c.*, n. sp.
- Diploxys cornuta*, Transvaal, DISTANT, p. 300, *t. c.*; *D. thoracica*, Mashonaland, DISTANT, p. 307, *t. c.*, n. spp.
- Dismegistus* (sub *Cimex*) *fimbriatus* Thunb. = (*Cydnus circumcinctus*, Hahn, = *Strachia ænescens*, Wlk.), DISTANT, p. 316, *t. c.*
- Durmia horizontalis*, Transvaal, DISTANT, p. 301, *t. c.*, n. sp.
- Dymantis relata*, Transvaal, DISTANT, p. 298, *t. c.*, n. sp.
- Euryaspis mashonæ*, Salisbury, DISTANT, p. 308, *t. c.*, n. sp.
- Eurydema consobrinum* var. n. *petulans*, HORVÁTH, p. 152, Rev. Ent. franc. xvii.
- Flaminia maxima*, Nyasaland, DISTANT, p. 313, Ann. Nat. Hist. (vii) ii, n. sp.
- Gonopsis lydenburgi*, Transvaal, DISTANT, p. 304, *t. c.*, n. sp.
- Holcostethus* (sub *Pentatoma*) *heterocera* Wlk. = (*obscuratus* Dist.), *H. apicalis* = (*Pentatoma confinis* Wlk.), DISTANT, p. 316, *t. c.*
- Macroscytus multisetosus*, Senegal, NOUALHIER, p. 232, Bull. Mus. Paris, 1898, n. sp.
- Malabama* n. g. near *Haplosterna*, for *M. æthiops* n. sp., Mashonaland, DISTANT, p. 309, *t. c.*
- Mecosoma marshalli*, Mashonaland, DISTANT, p. 308, *t. c.*, n. sp.
- Menida formosa* = (*nitens* Voll.), BREDDIN, p. 119, Ent. Nachr. xxiv.
- M. subcastanea*, Java, *id. l. c.*; *M. nyasæ*, Nyasaland, DISTANT, p. 313, Ann. Nat. Hist. (vii) ii : n. spp.
- Moyara*, n.g., *Asopinæ* near *Leptolobus*, for *M. insignis*, n. sp., Nyasaland, DISTANT, p. 314, *t. c.*
- Neostrachia*; characters and systematic position, BREDDIN, p. 113, Ent. Nachr. xxiv.
- N. schultheissi*, Borneo, *id.*, p. 114, *t. c.*, n. sp.
- Nezara robusta*, Mashonaland, DISTANT, p. 307, Ann. Nat. Hist. (vii) ii, n. sp.
- Noualhieridia*, n. g., p. 266, *Acanthosomini*, for *N. ornatula*, n. sp., Madagascar, p. 267, BREDDIN, Ent. Nachr. xxiv.
- Oncodochilus* (*Oncoeochilus* subg. n.) *taschenbergi*, Brazil, BREDDIN, p. 149, Jahresber. Ver. Magdeburg, 1896-98, n. sp.
- Oncoeochilus*, subg. n. of *Oncodochilus*, q. v.
- Panda*, n. g., p. 299, near *Ilerda*, for *P. signitenens*, n. sp., p. 300, Transvaal, DISTANT, Ann. Nat. Hist. (vii) ii.
- Philia vulcanica*, note on, MARTIN, p. 225, Bull. Soc. ent. France, 1898.
- P. ebenina*, New Britain, *id. t. c.*, p. 226, n. sp.
- Phyllocephala gunningi*, *serrata*, p. 305, *testacea*, p. 306, Transvaal, DISTANT, Ann. Nat. Hist. (vii) ii, n. spp.
- Piezosternum fallax*, Gold Coast, BREDDIN, p. 264, Ent. Nachr. xxiv, n. sp.
- Podisus*: habits and characters of N. American, KIRKLAND (677).
- Pododus orbicularis* = (*æqualis* Wlk.), DISTANT, p. 316, Ann. Nat. Hist. (vii) ii.
- Pretorius*, n. g. near *Dymantis*, for *P. tibialis*, n. sp., Transvaal, DISTANT, p. 298, *t. c.*
- Pygomenida*, n.g., p. 116, for *Rhaphigaster varipennis* Westw. and *P. pauper*, n. sp., Java, p. 117, BREDDIN, Ent. Nachr. xxiv.
- Raphigaster mongolica*, Karaschar, PUTON, p. 273, Rev. Ent. franc. xvii, n. sp.
- Rhopalimorpha ignota*, Chatham islands, HUTTON, p. 159, Tr. N. Zealand Inst. xxx, n. sp.

- Scribonia bipustulata* Wlk. (sub *Atelocera*) redescribed, DISTANT, p. 311, Ann. Nat. Hist. (vii) ii.
S. lydenburgi, Transvaal, DISTANT, p. 297, *t. c.*, n. sp.
Severiniella montandoni, Benguela, BREDDIN, p. 262, Ent. Nachr. xxiv, n. sp.
Storthogaster junodi, Delagoa bay, DISTANT, p. 134, Ann. Nat. Hist. (vii) ii, n. sp.
Tholagmus chobauti, N. Africa, PUTON, p. 166, Rev. Ent. franc. xvii; *T. confinis*, Kirghiz Steppes, HORVÁTH, p. 67, Rev. Ent. franc. xvii : n. spp.
Tropicorypha placida Wlk. (sub *Pentatoma*) redescribed, DISTANT, p. 299, Ann. Nat. Hist. (vii) ii.
Tyoma Spin. = (*Oxycoris* Mayr. = *Camara* Wlk.), *T. cryptorhyncha* = (*C. limosa* Wlk.), DISTANT, p. 316, *t. c.*

COREIDÆ.

- Anasa armigera*, habits, CHITTENDEN, p. 239, Canad. Ent. xxx.
Bardistus superbus, Costa Rica, DISTANT, p. 135, Ann. Nat. Hist. (vii) ii, n. sp.
Centrocoris subinermis and *variegatus*, distinguished, HORVÁTH, p. 148, Rev. Ent. franc. xvii.
Ceraleptus obtusus varr. n. *lugens*, *armeniacus*, HORVÁTH, p. 68, *t. c.*
Cletomorpha benita, Pulo Penang, KIRBY, J. Linn. Soc. xxiv, p. 97, n. sp. [omitted from Zool. Rec. 1891].
Molchina molitor, Bolivia, BREDDIN, p. 151, Jahresber. Ver. Magdeburg, 1896–1898, n. sp.
Serinetha chevreuxi, Senegal, NOUALHIER, p. 233, Bull. Mus. Paris, 1898, n. sp.

LYGÆIDÆ.

- Aphanus discrepans*, Senegal, NOUALHIER, p. 233, Bull. Mus. Paris, 1898, n. sp.
Apterola iberica, Spain, HORVÁTH, p. 283, Rev. Ent. franc. xvii, n. sp.
Blissus leucopterus, natural history, WEBSTER (1309).
Holcocranum diminutum, Turkestan, HORVÁTH, p. 68, Rev. Ent. franc. xvii, n. sp.
Joppeicus is not an *Aradid*, but belongs to the *Oxycareninæ*, BERGROTH, p. 188, Rev. Ent. franc. xvii.
Lygæus militaris, *pandurus*, distinguished, p. 149, *L. superbus* var. n. *monostigma*, p. 152, HORVÁTH, Rev. Ent. franc. xvii; *L. saxatilis*, var. n. *montivagus*, p. 281, *equestris*, *tristrami*, *superbus* varr. n. of, p. 283, HORVÁTH, *t. c.*
L. rubriceps, S. Russia, HORVÁTH, p. 282, *t. c.*, n. sp.
Nysius perplexus, Algeria, PUTON, p. 166, Rev. Ent. franc. xvii, n. sp.
Plinthisus autrani, Algeria, HORVÁTH, p. 152, Rev. Ent. franc. xvii, n. sp.
Rhyparochromus translucidus, Algeria, PUTON, p. 167, Rev. Ent. franc. xvii, n. sp.

PYRRHOCORIDÆ, BERYTIDÆ.

- Astemma nigerrimum*, Bolivia, BREDDIN, p. 153, Jahresber. Ver. Magdeburg, 1896–98, n. sp.
Megalomerium picticorne, Senegal, NOUALHIER, p. 233, Bull. Mus. Paris, 1898, n. sp.

TINGITIDÆ.

- Acalypta cervina*, var. n. *angustula*, HORVÁTH, p. 69, Rev. Ent. franc. xvii.
Acanthochila armigera Stål=(*spinuligera* Stål), CHAMPION, p. 60, Tr. ent. Soc. London, 1898.
- Acysta* n. g., for *A. integra*, pl. iii, fig. 22, p. 46, *interrupta*, fig. 23, p. 47, n. spp. Centr. America, CHAMPION, Biol. Centr.-Amer. Rhynch. ii.
- Amblystira pallipes*, figure, pl. ii, fig. 12, Tr. ent. Soc. London, 1898.
- Atheas* n. g., p. 44, for *A. flavipes*, pl. iii, fig. 19, *fuscipes*, fig. 20, *nigricornis*, fig. 21, p. 45, Central America, CHAMPION, Biol. Centr.-Amer. Rhynch. ii, n. spp.
- Corythaica*=(*Typonotus* Uhl.), CHAMPION, p. 58, Tr. ent. Soc. London, 1898.
- Corythuca fuscomaculata*, note and figure, p. 57, pl. ii, fig. 2, CHAMPION, t. c.
- Dichocysta*, n. g., p. 33, for *D. pictipes*, n. sp. Guatemala, p. 34, pl. iii, fig. 1, CHAMPION, Biol. Centr.-Amer. Rhynch. ii.
- Dolichocysta*, n. g. p. 56, for *D. venusta*, n. sp. Lower California, pl. ii, fig. 1, p. 57, CHAMPION, Tr. ent. Soc. London, 1898.
- Eurypharsa*: note on, CHAMPION, p. 63, t. c.
- E. fenestrata*, Panama, CHAMPION, pl. iii, fig. 17, p. 44, Biol. Centr.-Amer. Rhynch. ii; *E. quadrifenestrata*, Brazil, BERGROTH, p. 9, Wien. ent. Zeit. xvii : n. spp.
- Gargaphia*, characters, p. 58, *G. trichoptera*, pl. ii, fig. 5, CHAMPION, Tr. ent. Soc. London, 1898.
- Gonycentrum*, n. n. for *Telcia* Fieb. nec Hb., BERGROTH, p. 9, Wien. ent. Zeit. xvii.
- Leptobrysa steini*, figure, pl. ii, fig. 4, Tr. ent. Soc. London, 1898.
- Leptocysta sexnebulosa*, figure, pl. ii, fig. 10, t. c.
- Leptodictya fuscocincta*, figure, pl. ii, fig. 9, t. c.
- Leptostyla furcata*, figure, pl. ii, fig. 7, t. c.
- L. partita*, Mexico, CHAMPION, p. 48, pl. iii, fig. 26, Biol. Centr.-Amer. Rhynch. ii, n. sp.
- Monanthia loricata*, pl. iii, fig. 11, *parmata*, fig. 12, *monotropidia*, pl. iii, fig. 24, CHAMPION, Biol. Centr.-Amer. Rhynch. ii.
- M. c-nigrum*, Mexico, *id.* t. c., p. 47, pl. iii, fig. 25, n. sp.
- Pachycysta*, n. g., for *P. diaphana*, n. sp., Amazons, pl. ii, fig. 6, CHAMPION, p. 59, Tr. ent. Soc. London, 1898.
- Solenostoma liliputianum* Sign.=(*Coleopterodes fuscescens* Phil.), CHAMPION, p. 56, t. c.
- Sphærocysta globifera*, figure, pl. ii, fig. 10, t. c.
- Stephanitis mitrata*, note and figure, p. 58, pl. ii, fig. 3, CHAMPION, t. c.
- Teleonemia*: synonymy, p. 61, figures of *T. morio*, pl. iii, fig. 2, *validicornis*, fig. 4, *luctuosa*, fig. 5, *prolixa*, fig. 6, *belfragii*, fig. 8, *limbata*, fig. 10, *aterrima*, fig. 3, CHAMPION, t. c.
- T. longicornis*, pl. iii, fig. 7, p. 62, *brevipennis*, fig. 9, p. 63, Amazons, CHAMPION, t. c.; *T. ochracea*, pl. iii, fig. 3, *forticornis*, fig. 5, p. 36, *rugosa*, fig. 4, *pilicornis*, fig. 6, p. 37, *atrata*, fig. 7, *bifasciata*, fig. 8, p. 38, *notata*, fig. 11, p. 39, *nigrina*, fig. 13, *cylindricornis*, fig. 14, p. 41, *variegata*, fig. 15, *picta*, fig. 16, p. 42, *albomarginata*, fig. 18, p. 43, Central America, CHAMPION, Biol. Centr.-Amer. Rhynch. ii : n. spp.
- Tigava præcellens*, figure, pl. iii, fig. 1, Tr. ent. Soc. London, 1898.
- T. convexicollis*, Panama, CHAMPION, p. 33, pl. ii, fig. 29, Biol. Centr.-Amer. Rhynch. ii, n. sp.

PHYMATIDÆ.

Catalogue of the *Phymatidæ* of the Paris Museum, MARTIN, pp. 147–149, Bull. Mus. Paris, 1898.

Macrocephalus uhleri, Arizona, HANDLIRSCH, p. 383, Verh. Ges. Wien, 1898, n. sp.

M. aspersus, p. 57, pl. iv, fig. 11, *panamensis*, figg. 12, 13, p. 58, *angustatus*, figg. 15, 16, *granulatus*, figg. 17, 18, p. 59, *attenuatus*, fig. 19, p. 60, *inæqualis*, fig. 20, p. 61, *lepidus*, fig. 23, p. 62, *spiculosus*, figg. 24, 25, p. 63, Centr. America, CHAMPION, Biol. Centr.-Amer. Rhynch. ii, n. spp.

Phymata: figures of Central American, CHAMPION, pl. iv, pp. 50–54, *t. c.*

P. handlirschi, Panama, *id.* p. 52, pl. iv, fig. 6, *t. c.*; *P. horvathi*, Brazil, HANDLIRSCH, p. 382, Verh. Ges. Wien, 1898 : n. spp.

ARADIDÆ.

The Central American *Aradidæ* described and figured, CHAMPION, pp. 65–117, pls. v–vii, Biol. Centr.-Amer. Heter. ii. In the following lines we record only the new genera and species.

Aneurosoma, n. g. for *Aneurus dissimilis* Bergr., p. 116, figured, pl. vii, fig. 32, CHAMPION, *t. c.*

Aneurus montanus, pl. vii, fig. 26, p. 114, *tenuis*, fig. 28, p. 115, *tenuicornis*, fig. 30, p. 116, Centr. America, CHAMPION, *t. c.*, n. spp.

Aphleboderrhis comata, Panama, pl. v, fig. 24, p. 79, CHAMPION, *t. c.*, n. sp.

Aradus aterrimus, localities, MARTIN, p. 213, Bull. Soc. ent. France, 1898.

Artagerus hispidus, Panama, CHAMPION, p. 78, pl. v, fig. 23, *t. c.*, n. sp.

Brachyrrhynchus abdominalis = (*Mezira granulata* Am.), BERGROTH, p. 188, Rev. Ent. franc. xvii.

B. læviventris, p. 94, pl. vi, figg. 24, 25, *sinuatus*, fig. 26, p. 95, *longipilis*, fig. 29, *maculiventris*, pl. vii, fig. 1, p. 97, *constrictus*, fig. 2, p. 98, *regularis*, fig. 3, *neotropicalis*, fig. 4, p. 99, *angustatus*, fig. 6, p. 100, *latus*, *rugiventris*, p. 101, *rugicornis*, fig. 7, p. 103, *yucatanus*, fig. 8, *nanus*, fig. 9, p. 104, *divisus*, fig. 10, p. 105, Central America, CHAMPION, *t. c.*; *B. bouvieri*, *handlirschi*, S. America, BERGROTH, p. 150, Bull. Mus. Paris, 1898 : n. spp.

Calisiopsis, n. g. for *C. amplexiceps*, n. sp., pl. v, fig. 4, Panama, CHAMPION, p. 67, *t. c.*

Calisius ferox, Panama, p. 66, pl. v, fig. 2, CHAMPION, *t. c.*, n. sp.

Cinyphus squalidus, p. 89, pl. vi, fig. 18, *lutosus*, fig. 19, p. 90, Panama, CHAMPION, *t. c.*; *C. subtruncatus*, Venezuela, BERGROTH, p. 149, Bull. Mus. Paris, 1898, n. spp.

Coloborrhynchus, n. g., p. 105, for *C. pumilio*, n. sp., Panama, pl. vii, fig. 11, p. 106, CHAMPION, *t. c.*

Dysodius brevipes, Mexico, BERGROTH, p. 26, Wien. ent. Zeit. xvii, n. sp.

Helenus hirsutus, Panama, CHAMPION, p. 75, pl. v, fig. 16, Biol. Centr.-Amer. Rhynch. ii, n. sp.

Joppeicus: cf. *Lygæidæ*.

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Nannium, n. g. for *N. parvum*, p. 100, *elongatum*, Venezuela, *subovatulum*, Brazil, p. 101, n. spp., BERGROTH, Ent. Mag. 1898.

N. bituberculatum, Guatemala, CHAMPION, p. 85, pl. vi, fig. 8, Biol. Centr.-Amer. Rhynch. ii, n. sp.

Neuroctenus pseudonymus, N. America, BERGROTH, p. 27, Wien. ent. Zeit. xvii; *N. bergrothi*, pl. vii, fig. 12, p. 107, *mexicanus*, fig. 22, p. 111, *amplus*, fig. 23, p. 112, *subparallelus*, fig. 25, p. 113, Central America,

- CHAMPION, Biol. Centr.-Amer. Rhynch. ii; *N. longulus*, Cayenne, BERGROTH, p. 151, Bull. Mus. Paris, 1898 : n. spp.
Phyllotingis Wlk. = (*Phyllocraspedum* Bergr.), CHAMPION, p. 55, Tr. ent. Soc. London, 1898.
Pictinus armatus, pl. vi, fig. 1, *spiniger*, fig. 2, p. 81, *breviceps*, fig. 3, p. 82, *denticollis*, fig. 4, *quadraticeps*, fig. 6, p. 83, *parviceps*, fig. 7, p. 84, Panama, CHAMPION, Biol. Centr.-Amer. Rhynch. ii, n. spp.
Proxius palliatus, pl. v, fig. 5, *personatus*, figg. 6, 7, p. 69, CHAMPION, *t. c.* ; *P. gypsatus*, Venezuela, BERGROTH, p. 100, Ent. Mag. 1898 : n. spp.
Psorosoma, n. g. for *P. forficulinum*, n. sp., Panama, pl. v, fig. 15, CHAMPION, p. 72, Biol. Centr.-Amer. Rhynch. ii.

HEBRIDÆ.

- Hebrus major*, pl. viii, fig. 1, p. 118, *hirsutus*, fig. 2, *bilineatus*, fig. 3, p. 119, *læviventris*, fig. 5, *sulcatus*, fig. 6, p. 120, Central America, CHAMPION, Biol. Centr.-Amer. Rhynch. ii, n. spp.
Merragata leucosticta, pl. viii, fig. 8, *brevis*, fig. 9, CHAMPION, p. 122, *t. c.*, n. spp.
Mesovelvia mulsanti, pl. viii, figg. 10, 11, p. 123, CHAMPION, *t. c.*

HYDROMETRIDÆ.

- List of *Hydrometridæ* omitted from the Lethierry and Severin Catalogue, KIRKALDY, p. 2, Entomologist, 1898.
Brachymetra albinervus, pl. ix, fig. 19, p. 153, CHAMPION, Biol. Centr.-Amer. Rhynch. ii.
B. bakeri, Colombia, KIRKALDY, p. 101, Entomologist, 1898 ; *B. fuscinervis*, Argentina, BERG, p. 3, Com. Mus. Buenos Aires, i : n. spp.
Gerris mexicanus, pl. ix, fig. 10, p. 147, *cariniventris*, figg. 11, 12, p. 148, *flavolineatus*, figg. 13–15, p. 149, Centr. America, CHAMPION, Biol. Centr.-Amer. Rhynch. ii, n. spp.
Hydrometra caraïba, systematic position, KIRKALDY, p. 73, Rev. Ent. franc. xvii.
H. greeni, Ceylon, KIRKALDY, p. 2, Entomologist, 1898 ; *H. lentipes*, p. 125, Guatemala, CHAMPION, Biol. Centr.-Amer. Rhynch. ii : n. spp.
Limnogonus hyalinus, p. ix, fig. 18, p. 153, CHAMPION, *t. c.*
Limnometra opaca, pl. ix, fig. 16, p. 150, *quadrilineata*, fig. 17, p. 151, Centr. America, CHAMPION, *t. c.*, n. spp.
Microvelia flavipes, pl. viii, fig. 12, *paludicola*, fig. 13, p. 127, *panamensis*, fig. 14, *torquata*, fig. 15, p. 128, *circumcincta*, fig. 16, *albonotata*, fig. 17, p. 129, *rufescens*, fig. 18, *setipes*, fig. 19, p. 130, Centr. America, CHAMPION, *t. c.*, n. spp.
Neovelvia whitei, Lagoa Santa, BREDDIN, p. 162, Jahresber. Ver. Magdeburg, 1896–98, n. sp.
Paravelia, n. g., near *Velia*, p. 159, for *P. boliviana*, n. sp., Bolivia, p. 160, BREDDIN, Jahresber. Ver. Magdeburg, 1896–98.
Platygerris cæruleus, Costa Rica, CHAMPION, p. 157, pl. ix, fig. 25, Biol. Centr.-Amer. Rhynch. ii, n. sp.
Potamobates, n. g., p. 154, for *P. unidentatus*, Panama, pl. ix, fig. 20, *bidentatus*, fig. 22, p. 155, Mexico, n. spp., CHAMPION, *t. c.*
Rhagovelvia = (*Neovelvia* White), CHAMPION, p. 112, Ent. Mag. 1898.
R. crassipes, pl. viii, figg. 20, 21, *varipes*, fig. 22, p. 133, *femoralis*, fig. 23, p. 134, *spinigera*, fig. 28, *tenuipes*, figg. 29, 30, p. 137, *uncinata*, pl. ix, figg. 1, 2, p. 138, *insularis*, fig. 3, p. 139, Centr. America, CHAMPION, Biol. Centr.-Amer. Rhynch. ii, n. spp.

- Telmatobates*, n. g., p. 4, *Halobatinae*, for *T. bonariensis*, n. sp., S. America, p. 5, BERG, Com. Mus. Buenos Aires, i.
- Trepobatopsis*, n. g., p. 157, for *T. denticornis*, n. sp., Mexico, pl. ii, fig. 26, p. 158, CHAMPION, Biol. Centr.-Amer. Rhynch. ii.
- Trochopus*, n. g. near *Halobates*, p. 78, for *T. marinus*, n. sp., Jamaica, p. 79, pl. iii, CARPENTER, Ent. Mag. 1898; *Trochopus* is closely allied to *Rhagovelis*, *id. t. c.*, pp. 109–112.
- T. salinus*, Panama, CHAMPION, p. 140, pl. ix, figg. 4, 5, Biol. Centr.-Amer. Rhynch. ii, n. sp.
- Velis noualkieri*, macropterous form, PUTON, p. 168, Rev. Ent. franc. xvii.
- V. brunnea*, Algeria, HORVÁTH, p. 153, *t. c.*; *V. annulipes*, pl. ix, fig. 8, p. 142, *cinctipes*, fig. 9, p. 143, Cent. America, CHAMPION, Biol. Centr.-Amer. Rhynch. ii : n. spp.

REDUVIIDÆ.

- Apiomerus immundus*, Mexico, BERGROTH, p. 307, Bull. Soc. ent. France, 1898, n. sp.
- Apronius octonotatus*, Panama, pl. xi, fig. 22, p. 186, CHAMPION, Biol. Centr.-Amer. Rhynch. ii, n. sp.
- Bactrodes biannulatus*, pl. xi, fig. 1, *spinulosus*, fig. 2, *t. c.*
- Chryxinae*, subfam. n. for *Chryxus*, n. g., with *C. tomentosus*, Panama, n. sp., pl. xi, fig. 9, p. 181, CHAMPION, *t. c.*
- Cleptria thoracica*, Niam Niam, JONCK, p. 339, Ann. Soc. ent. Belgique, xlii, n. sp.
- Dasyncnemus*, n. g., p. 186, *Holoptilinae*, for *D. sahlbergi*, n. sp., Egypt, p. 187, BERGROTH, Rev. Ent. franc. xvii.
- Diaditus hirticornis*, pl. xi, fig. 20, *pictipes*, fig. 21, p. 189, Central America, CHAMPION, Biol. Centr.-Amer. Rhynch. ii, n. sp.
- Emesa mantis*, Fab., referred to *Westermannia*, CHAMPION, p. 258, Ent. Mag. 1898; *E. longipes*, pl. x, fig. 13, nymph, p. 169, CHAMPION, Biol. Centr.-Amer. Rhynch. ii.
- Gardena americana*, pl. x, fig. 12, p. 167, Central America, CHAMPION, *t. c.*, n. sp.
- Ghilianella bulbifera*, pl. x, figg. 17, 18, *granulata*, fig. 19, p. 171, *gibbiventris*, fig. 20, p. 172, Central America, CHAMPION, *t. c.*, n. spp.
- Gnathobleda fraudulenta*, pl. xi, fig. 16, *litigiosa*, fig. 17, p. 184, CHAMPION, *t. c.*
- Luteva macrophthalma*, pl. x, fig. 24, Biol. Centr.-Amer. Rhynch. ii.
- Lutevopsis*, n. g., p. 165, *Emesides*, for *L. longimanus*, pl. x, fig. 10, Mexico, *ornata*, fig. 11, Panama, n. spp., p. 166, CHAMPION, *t. c.*
- Macrophthalmus rhabdophorus*, Bolivia, BREDDIN, p. 155, Jahresber. Ver. Magdeburg, 1896–98, n. sp.
- Nalata quadrituberculata*, pl. xi, fig. 23, p. 191, *nigrescens*, fig. 24, *irrorata*, fig. 26, p. 192, Centr. America, CHAMPION, Biol. Centr.-Amer. Rhynch. ii; *N. squalida*, Colombia, BERGROTH, p. 307, Bull. Soc. ent. France, 1898 : n. spp.
- Narvesus carolinensis*, pl. xi, fig. 19, Biol. Centr.-Amer. Rhynch. ii.
- Oncocephalus gularis* var. n. *marginicollis*, HORVÁTH, p. 69, Rev. Ent. franc. xvii.
- O. pugnax*, p. 69, *ocularis*, p. 71, Syria, HORVÁTH, *t. c.*, n. spp.
- Physorhynchus dimorphus*, p. 340, *rufipes*, p. 341, *elongatus*, p. 342, Congo, JONCK, Ann. Soc. ent. Belgique, xlii, n. spp.
- Ploiariodes armata*, Guatemala, CHAMPION, p. 165, pl. x, fig. 9, Biol. Centr.-Amer. Rhynch. ii, n. sp.
- Ploiariopsis*, n. g., *Emesides*, p. 173, for *P. megalops*, Panama, pl. x, fig. 21, *prædator*, Guatemala, fig. 22, n. spp., p. 174, CHAMPION, *t. c.*

- Psirontis spinimanus*, Guatemala, CHAMPION, pl. xi, fig. 10, p. 182, *t. c.*, n. sp.
Pothea cimboides, Bolivia, BREDDIN, p. 157, Jahresber. Ver. Magdeburg, 1896–98, n. sp.
Putoniola, n. n. for *Putoniella* Mont. nec Kieff., BERGROTH, p. 186, Rev. Ent. franc. xvii.
Pygolampis spurca, pl. xi, figg. 14, 15, p. 183, Biol. Centr.-Amer. Rhynch. ii.
Racelda mærens, Brazil, BREDDIN, p. 158, Jahresber. Ver. Magdeburg, 1896–98, n. sp.
Saica rubripes, pl. xi, fig. 3, p. 177, *erubescens*, fig. 5, p. 178, CHAMPION, Biol. Centr.-Amer. Rhynch. ii, n. spp.
Salyavata variegata, pl. xi, fig. 25, *t. c.*
Schumannia, n. g., near *Ctenotrachelus*, for *S. mexicana*, n. sp., Atoyac, CHAMPION, pl. xi, fig. 18, p. 185, *t. c.*
Tagalis seminigra, Panama, pl. xi, fig. 7, p. 179, CHAMPION, *t. c.*, n. sp.
Westermannia annulata, *difficilis*, pl. x, figg. 7, 8, *t. c.*

HENICOCEPHALIDÆ.

- Henicocephalus concolor*, pl. x, fig. 1, *annulipes*, fig. 2, *pilosus*, fig. 3, p. 160, *emarginatus*, fig. 4, *angustatus*, fig. 5, p. 161, Central America, CHAMPION, Biol. Centr.-Amer. Rhynch. ii, n. spp.
Hymenocoris, n. g., p. 181, for *H. formicina*, n. sp., California, UHLER, Tr. Maryland Ac. 1892.
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POLYCTENIDÆ.

- Polycytenes talpa*, Nias island, SPEISER, p. 614, Zool. Anz. 1898, n. sp.

CAPSIDÆ.

- Adelphocoris insignis*, Servia, HORVÁTH, p. 501, Termes. Fuzetek, xxi, n. sp.
Brachycoleus thoracicus, var. n. *nigricans*, PUTON, p. 169, Rev. Ent. franc. xvii.
Byrsoptera syriaca, male, HORVÁTH, p. 504, Termes. Fuzetek, xxi.
Calocoris striolatus, n. n. for *lineolatus* Berg., BERGROTH, p. 35, Wien. ent. Zeit. xvii.
Caulotops, n. g., p. 33, *Briocoraria*, for *C. puncticollis*, n. sp. La Plata, p. 34, BERGROTH, *t. c.*
Chlamydatus bakeri, n. n. for *C. signatus* Baker, BERGROTH, p. 35, *t. c.*
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Coquillettia, n. g., p. 78, *Cyllecoraria*, for *C. insignis*, n. sp., California, p. 79, UHLER, *t. c.*
Cyllocoris petiolatus, referred to *Xenetus*, BERGROTH, p. 35, Wien. ent. Zeit. xvii.
Dicyphus minimus, Uhler, natural history, cuts, HOWARD, p. 134, Yearb. U. S. Dep. Agric. 1898.
Dimorphocoris bleusei, Algeria, PUTON, p. 169, Rev. Ent. franc. xvii, n. sp.
Ectopiocerus, n. g., *Cyllecoraria*, p. 73, for *E. anthracinus*, n. sp., California, p. 74, UHLER, Tr. Maryland Ac. 1890.
Hadrodema pulverulenta, Utah, UHLER, p. 183, Tr. Maryland Ac. 1892, n. sp.

- Halticus asperulus*, Armenia, HORVÁTH, p. 503, Termes. Fuzetek, xxi, n. sp.
- Isometopus heterocephalus*, Algeria, p. 273, *tæniaticeps*, Syria, p. 274, PUTON, Rev. Ent. franc. xvii, n. spp.
- Laurinia chobauti*, Algeria, PUTON, p. 168, *t. c.*, n. sp.
- Lygus cervinus* var. n. *coccineus*, HORVÁTH, p. 502, Termes. Fuzetek, xxi.
- Macrotylus fuentei*, Spain, HORVÁTH, p. 504, *t. c.*; *M. regalis*, p. 86, *tristis*, p. 87, *vestitus*, p. 88, N. America, UHLER, Tr. Maryland Ac. 1890 : n. spp.
- Mimoceps*, n. g., p. 83, *Myrmecoraria*, for *M. insignis*, p. 84, *gracilis*, p. 85, n. spp., North America, UHLER, *t. c.*
- Misilla*, n. g., p. 154, *Laboparia*, for *M. flavipes*, n. sp., Algeria, p. 155, HORVÁTH, Rev. Ent. franc. xvii.
- Oncopeltus rufo-scutellatus*, referred to *Resthenia*, and described, BERGROTH, p. 34, Wien. ent. Zeit. xvii.
- Phytocoris miridioides*, brachypterous form, HORVÁTH, p. 150, Rev. Ent. franc. xvii.
- Piezocranum seminulum*, Spain, HORVÁTH, p. 503, Termes. Fuzetek, xxi ; *P. frontosum*, Algeria, HORVÁTH, p. 155, Rev. Ent. franc. xvii : n. spp.
- Plagiognathus bipunctatus* var. n. *picticornis*, HORVÁTH, p. 505, Termes. Fuzetek, xxi.
- Pycnoptera* (sub *Odontoplatys*) *suturalis* Jak.=(*sibiricus* Reut.), HORVÁTH, p. 501, *t. c.*
- Resthenia falloui*, Brazil, BERGROTH, p. 35, Wien. ent. Zeit. xvii, n. sp.
- Rhinocapsus*, n. g., p. 81, *Cyllecoraria*, for *R. vanduzeei*, n. sp., New York, p. 82, UHLER, Tr. Maryland Ac. 1890.
- Stenodema instabilis*=(*affinis* Reut.), BERGROTH, p. 33, Wien. ent. Zeit. xvii.
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- Xenetus*, *Zacynthus*, *Zosippus*, referred to *Pilophoraria*, BERGROTH, p. 35, Wien. ent. Zeit. xvii.
- X. regalis*, p. 80, *scutellatus*, p. 81, North America, UHLER, Tr. Maryland Ac. 1890, n. spp.

HYDROCORISÆ.

- Review of recent systematic work on *Hemiptera Cryptocerata*, HANDLIRSCH (524).
- Use of *Notonecta* and *Corixa* as food, KIRKALDY, p. 173, Ent. Mag. 1898.
- Agraptocorixa*, subg. n., cf. *Corixa*, q.v.
- Ambrysus obscuratus*, Pernambuco, MONTANDON, p. 282, Bull. Soc. Bucarest, vii, n. sp.
- Anisops scutellaris*, synonymical note, KIRKALDY, p. 145, Ann. Mus. Genova, xxxix.
- A. hyperion*, Queensland, p. 141, *persephone*, Madagascar, p. 142, KIRKALDY, Wien. ent. Zeit. xvii, n. spp.
- Basileocorixa*, subg. n. of *Corixa*, KIRKALDY, p. 253, Entomologist, 1898.
- Belostoma niloticum*, var. n. *persicum*, MONTANDON, p. 431, Bull. Soc. Bucarest, vii.
- B. insulanum*, New Guinea, New Caledonia, p. 430, *edentulum*, Australia, p. 432, MONTANDON, *t. c.*, n. spp.
- Corixa holda*, n. n. for *fasciolata* Heer. nec Muls., KIRKALDY, p. 3, Entomologist, 1898 ; *C. carinata* and *germari*, characters, KIRKALDY, p. 249, *t. c.*
- C. (Agraptocorixa)* subg. n.) *gestroi*, Somaliland, KIRKALDY, p. 144, Ann. Mus. Genova, xxxix, n. sp.

- Enithares martini*, Philippines, KIRKALDY, p. 151, Bull. Mus. Paris, 1898 ;
E. horvathi, Celebes, p. 72, *hippokleides*, Java, p. 73, KIRKALDY, Rev. Ent. franc. xvii : n. spp.
- Laccotrephes calcaratus*, p. 506, *armatus*, p. 507, *oculatus*, p. 509, Africa, MONTANDON, Bull. Soc. Bucarest, vii, n. spp.
- Limnocoris bouvieri*, Bogota, p. 418, *obscurus*, Colombia, p. 419, *bergrothi*, Venezuela, p. 420, *ochraceus*, Colombia, p. 421, *dubiosus*, Chili, p. 422, *inornatus*, Guatemala, p. 423, *maculiceps*, Matto Grosso, p. 424, MONTANDON, Verh. Ges. Wien, 1898, n. spp.
- Micronecta striata*, *siva*, etc., synonymy, KIRKALDY, p. 3, Entomologist, 1898.
- Nepa apiculata* and *cinerea*, note on, MONTANDON, p. 511, Bull. Soc. Bucarest, vii.
- Nepoidea tibialis*, *intermedia*, p. 66, *falloui*, p. 67, S. America, *montandoni*, Mexico, p. 68, MARTIN, Bull. Soc. ent. France, 1898, n. spp.
- Pedinocoris macronyx*, note on, KIRKALDY, p. 2, Entomologist, 1898.
- Pelocoris*, notes on the varieties and races, MONTANDON, p. 284, Bull. Soc. Bucarest, vii.
- P. nitidus*, Darien, p. 287, *subflavus*, p. 288, *magister*, p. 289, Brazil, *id. t. c.*, n. spp.
- Pelogonus nasutus*, Australia, p. 72, *splendidulus*, Ecuador, p. 73, MONTANDON, Bull. Mus. Paris, 1898, n. spp.
- Plea frontalis* Fieb. noticed, KIRKALDY, p. 141, Wien. ent. Zeit. xvii.
- P. brunni*, Queensland, *id. l. c.*, n. sp.
- Ranatra compressicollis*, Venezuela, MONTANDON, p. 56, Bull. Soc. Bucarest, vii, n. sp.

HEMIPTERA-HOMOPTERA.

[*Cf.* BAKER (40 to 46), DUZEE (326), EDWARDS (341), FOWLER (474), GILLANDERS (469), GILLETTE (470), GODING (473), HORVÁTH (561), HUTTON (587), MARLATT (819), MASKELL (830), MATSUMURA (833), MELICHAR (843 to 846), OSBORN & BALL (913), PUTON (985, 986), RÜBSAAMEN (1050), THEN (1205), UHLER (1251, 1253-1255). Also *Aphididæ*, *Aleurodidæ* and *Coccidæ*.]

For many synonymic remarks, not reproduced below, on palæarctic species, cf. HORVÁTH, Rev. Ent. franc. xvii, pp. 275-281.

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CICADIDÆ.

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C. cinctifera, N. America, p. 156, *reticularis*, Jamaica, p. 157, UHLER, Tr. Maryland Ac. 1892 ; *C. sordidata*, p. 175, *reperta*, p. 177, Florida, UHLER, *t. c.* : n. sp.

Melampsaltria yezoensis, Japan, MATSUMURA, p. 17, Annot. Zool. Japon. i, n. sp.

- Odopæa caribæa*, p. 169, *domingensis*, p. 172, San Domingo, UHLER, Tr. Maryland Ac. 1892, n. spp.
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T. cruentifera, p. 161, *blaisdellii*, p. 163, N. America, UHLER, t. c. :
 n. spp.

FULGORIDÆ.

- Ricaniides* : Monograph, MELICHAR, pp. 197–359, pls. ix–xiv, Ann. Hofmus. Wien, xiii. The new genera and species were previously diagnosed in Verh. Ges. Wien, 1898, and our references are therefore to that work; though fuller descriptions will be found in the above named pages.
- Alisca compacta*, Bantimoerang, MELICHAR, p. 397, Verh. Ges. Wien, 1898, n. sp.
- Aphanophrys*, n. g., *Ricaniides*, for *A. solita*, Solomon islds., *spilota*, Aru, *annulata*, New Guinea, n. spp., MELICHAR, t. c.
- Armacia fusca*, Baru isld., MELICHAR, p. 397, t. c., n. sp.
- Belonocharis*, n. g., p. 145, near *Scolops*, for *B. fumida*, n. sp., California, p. 146, UHLER, Tr. Maryland Ac. 1892.
- Bladina osborni*, Bahia, MELICHAR, p. 397, Verh. Ges. Wien, 1898, n. sp.
- Chloriona dorsata*, Haute Savoie, EDWARDS, p. 59, Ent. Mag. 1898, n. sp.
- Conosimus noualhieri*, Algeria, PUTON, p. 171, Rev. Ent. franc. xvii, n. sp.
- Danepteryx*, n. g. for *D. manca*, n. sp., California, UHLER, p. 42, Tr. Maryland Ac. 1889.
- Dictyobia*, n. g. for *D. permutata*, n. sp., California, UHLER, p. 39, t. c.
- Dictyonina*, n. g., p. 40, for *D. obscura*, n. sp., California, UHLER, p. 41, t. c.
- Dyctidea*, n. g. for *D. angustata*, p. 37, *intermedia*, p. 38, n. spp., California, UHLER, t. c.
- Epitemna*, n. g., *Ricaniides*, for *E. fuscoænea*, *retracta*, *duplicata*, Africa, p. 58, *speculifera*, *cyanea*, *pilifera*, Antilles, p. 59, n. spp., MELICHAR, Verh. Ges. Wien, 1898.
- Euricania*, n. g., *Ricaniides*, for *E. hyalinocostata*, Warou, morio, p. 393, *infesta*, p. 394, New Guinea, n. spp., MELICHAR, t. c.
- Gæstulia nigrovenosa*, Darjeeling, p. 399, *fulva*, Centr. America, p. 400, MELICHAR, t. c., n. spp.
- Issidius*, n. g. for *Issus rotundiceps*, PUTON, p. 170, Rev. Ent. franc. xvii.
- Kelisia axialis*, p. 232, *crocea*, p. 233, N. America, DUZEE, Bull. Buffalo Soc. v, n. spp.
- Laccocera*, n. g., near *Delphacinus*, p. 241, for *L. vittipennis*, p. 242, *zonatus*, p. 243, *L. ? obesa*, p. 244, n. spp., N. America, DUZEE, t. c.
- Liburnia excisa*, Schleswig-Holstein, MELICHAR, p. 67, Wien. ent. Zeit. xvii; *L. detecta*, p. 248, *consimilis*, p. 249, *puella*, *osborni*, p. 250, *laminalis*, p. 251, *lutulenta*, *weedi*, p. 252, *lateralis*, *kilmani*, p. 253, *campestris*, p. 254, *lineatipes*, p. 255, *occlusa*, p. 256, *foveata*, p. 257, *gilletti*, *L. ? incerta*, p. 258, N. America, DUZEE, Bull. Buffalo Soc. v : n. spp.
- Megamelus marginatus*, p. 234, *davisi*, p. 235, N. America, DUZEE, t. c., n. spp.
- Mindura imbuta*, New Guinea, *nubecula*, Celebes, etc., MELICHAR, p. 397, Verh. Ges. Wien, 1898, n. sp.
- Nogodina cognata*, Java, MELICHAR, p. 398, t. c., n. sp.
- Pentagramma*, n. g., type *Liburnia vittatifrons* Uhl., DUZEE, p. 260, Bull. Buffalo Soc. v.
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- Pocharica dolosa*, p. 394, *illota*, *pavida*, *decempunctata*, *juvenca*, p. 395, Madagascar, MELICHAR, *t. c.*, n. spp.
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- Pochazoides bipunctatus*, *nobilis*, *exul*, *insularis*, Madagascar, p. 395, *exilis*, E. Africa, p. 396, MELICHAR, *t. c.*, n. spp.
- Privesa exuta*, Australia, *disturbata*, S. Africa, *delecta*, Bombay, p. 396, *soluta*, Madagascar, p. 397, MELICHAR, *t. c.*, n. spp.
- Ricania japonica*, Japan, *proxima*, Indian Arch., *fuscata*, Cameroons, *confusa*, Cape York, *venustula*, Madagascar, p. 386, *plagiata*, Java, *geometra*, *cervina*, *media*, Africa, *subfusca*, Celebes, *morula*, Africa, p. 387, *noualhieri*, *punctulata*, Madagascar, *sollicita*, Brazil, *spoliata*, Ceylon, *morosa*, New Guinea, *conspersa*, Solomon islands, p. 388, *similata*, Tenass Valley (sic), *adjuncta*, *horvathi*, *indicata*, *integra*, *eximia*, New Guinea, p. 389, *detersa*, Africa, p. 390, MELICHAR, *t. c.*, n. spp.
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- Scolypopa partita*, Madagascar, MELICHAR, p. 396, *t. c.*, n. sp.
- Stenocranus lautus*, p. 231, *palaetus*, p. 232, N. America, DUZEE, Bull. Buffalo Soc. v, n. spp.
- Tarundia curtula*, Solomon islands, *glaucescens*, New Guinea, *marginata*, Mauritius, MELICHAR, p. 394, Verh. Ges. Wien, 1898, n. spp.
- Ticida*, n. g., p. 143, near *Acrisius*, for *T. cingulata*, n. sp., California, p. 144, UHLER, Tr. Maryland Ac. 1891.
- Varcia æquata*, *lurida*, Brazil, *debilis*, hab. ?, *pyramidalis*, Borneo, p. 398, *apicata*, New Guinea, p. 399, MELICHAR, Verh. Ges. Wien, 1898, n. spp.
- Vutina retusa*, Amazons, MELICHAR, p. 397, *t. c.*, n. spp.

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- Tomaspis conspicua*, pl. xiv, fig. 23, p. 206, *t. c.*

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- Acrobelus*; characters, FOWLER, p. 213, Biol. Centr.-Amer. Rhynch. Homopt. ii.
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- Anosterostemma noualhieri*, Pyrenees, MELICHAR, p. 63, Rev. Ent. franc. xvii, n. sp.
- Athysanella*, n. g. for *A. magdalena*, n. sp., New Mexico, BAKER, p. 185, Psyche, viii.
- Athysanus*: early states of some N. American, OSBORN & BALL, pp. 91, 92, pls. vi, vi, P. Davenport Ac. vii.
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- Bathysmatophorus uhleri*, California, BAKER, p. 260, Psyche, viii, n. sp.
- Bythoscopus variabilis* var. n. *coloradensis*, BAKER, p. 198, t. c.; *B. distinctus*, larva, OSBORN & BALL, p. 65, pl. ii, fig. 2, P. Davenport Ac. vii.
- B. truncatus*, Michigan, BAKER, p. 198, Psyche, viii, n. sp.
- Catorthorrhinus*, n. g., near *Aulacizes*, for *C. resimus*, n. sp., Panama, pl. xiii, fig. 10, FOWLER, p. 213, Biol. Centr.-Amer. Rhynch. Homopt. ii.
- Cephalelus bleusei*, Algeria, PUTON, p. 172, Rev. Ent. franc. xvii, n. sp.
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- D. putoni*, France, THEN, p. 49, t. c.; *D. megalurus*, Algeria, PUTON, p. 173, Rev. Ent. franc. xvii; *D. imputans*, p. 75, *cruciatu*, p. 77, *obtectus*, p. 78, N. America, *obesus*, p. 81, N. America and Mexico, OSBORN & BALL, P. Davenport Ac. vii: n. spp.
- Dicraneura maculata*, p. 716, *cruentata*, p. 717, *unipuncta*, *communis*, p. 718, *kunzei*, p. 721, *quadrivittata*, p. 723, N. America, GILLETTE, P. U. S. Mus. xx, n. spp.
- Diestostemma rugicolle*, pl. xiii, fig. 1, p. 208, Biol. Centr.-Amer. Rhynch. Homopt. ii.
- Dorycephalus vanduzei*, Iowa, OSBORN & BALL, P. Davenport Ac. vii, p. 74, pl. vi, fig. 2, n. sp.
- Dorydium sefense*, Algeria, PUTON, p. 274, Rev. Ent. franc. xvii, n. sp.
- Driotura*, n. g. for *D. robusta*, n. sp., Iowa, pl. iv, fig. 4, and including *gammaroidea* V. D., OSBORN & BALL, P. Davenport Ac. vii.
- Empoasca trifasciata*, p. 726, *livingstonii*, p. 728, *unicolor*, *splendida*, p. 731,

- albolinea*, p. 732, *denticula*, p. 734, *pergandei*, *incisa*, p. 735, *atrolabes*, p. 736, N. America, *mexicana*, Mexico, p. 737, *radiata*, p. 738, *robusta*, p. 739, *pallida*, *snowi*, p. 741, *alboneura*, p. 743, *tumida*, p. 744, N. America, GILLETTE, P. U. S. Mus. xx, n. spp.
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- Eupteryx vanduzeei*, p. 748, *flavoscuta*, p. 749, N. America, GILLETTE, P. U. S. Mus. xx, n. spp.
- Eutettix scaber*, p. 96, *cincta*, p. 97, *modesta*, p. 98, N. America, OSBORN & BALL, P. Davenport Ac. vii, n. spp.
- Idiocerus alternatus*, life-history, OSBORN & BALL, t. c. p. 70, pl. ii, fig. 1.
- I. vicinus*, Spain, MELICHAR, p. 66, Rev. Ent. franc. xvii; *I. moniliferæ*, p. 71, pl. iii, fig. 2, *brunneus*, fig. 3, p. 72, N. America, OSBORN & BALL, P. Davenport Ac. vii : n. spp.
- Lonatura*, n. g. for *L. catalina*, p. 83, pl. 14, fig. 2, *L. ? megalopa*, p. 85, fig. 1, n. spp., OSBORN & BALL, t. c.
- Macropsis apicalis*, Iowa, p. 64, pl. ii, fig. 1, OSBORN & BALL, t. c., n. sp.
- Neocalidea*, characters amended, BAKER, p. 289, Canad. Ent. xxx.
- N. lineata*, *obscura*, p. 289, *pallida*, N. America, *rubrolineata*, Brazil, p. 290, *barretti*, Mexico, *bimaculata*, *smithii*, p. 291, South America, *id. t. c.*, n. spp.
- Paracalidea*, n. g., *Jassini*, for *P. tuberculata*, n. sp., N. America, BAKER, p. 292, t. c.
- Pediopsis suturalis*, *gleditschiæ*, p. 67, *crocea*, p. 68, *reversalis*, p. 69, N. America, OSBORN & BALL, P. Davenport Ac. vii, n. spp.
- Phlepsius altus*, p. 99, pl. vi, fig. 3, *nebulosus*, p. 100, fig. 4, notes on, OSBORN & BALL, t. c.
- P. pulcher*, Turkestan, MELICHAR, p. 65, Rev. Ent. franc. xvii; *P. dentatus*, *pulchripennis*, p. 65, *pusillus*, *occidentalis*, p. 66, *mimus*, p. 67, N. America, BAKER, Ent. News Philad. 1898; *P. areolatus*, *personatus*, p. 30, *texanus*, p. 31, *rileyi*, p. 32, N. America, BAKER, Canad. Ent. xxx : n. spp.
- Scaphoideus*, n. g., p. 33, for *Jassus immistus* Say, and *S. intricatus*, *jucundus*, p. 34, *consors*, p. 36, n. spp., N. America, UHLER, Tr. Maryland Ac. 1889.
- Terulia magna*, Brazil, BAKER, p. 292, Canad. Ent. xxx, n. sp.
- Tettigometra obliqua*, habits, DOBENECK, p. 369, Illustr. Zeitschr. Ent. iii.
- Tettigonia circellata*, p. 285, *cythura*, *aurora*, p. 286, N. America, BAKER, Psyche, viii, n. spp.
- Thamnotettix suturalis*, Turkestan, MELICHAR, p. 64, Rev. Ent. franc. xvii, n. sp.
- Typhlocyba bipunctata*, p. 751, *tunicarubra*, p. 752, *hartii*, p. 754, *rubroscuta*, p. 755, *illinoiensis*, p. 758, *dentata*, p. 765, *crevecœuri*, p. 767, N. America, GILLETTE, P. U. S. Mus. xx, n. spp.
- Xerophlæa major*, Virginia, BAKER, p. 285, Psyche, viii, n. sp.

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- Aphalara lichenoides*, Algeria, PUTON, p. 175, Rev. Ent. franc. xvii; *A. tecta*, Victoria, MASKELL, p. 6, pl. ii, figg. 5–10, Tr. Soc. S. Austral. xxii : n. spp.
- Diaphorina chobauti*, Biskra, PUTON, p. 175, Rev. Ent. franc. xvii, n. sp.
- Euphyllura lugubrina*, Algeria, CHOBAUT, p. 174, Rev. Ent. franc. xvii, n. sp.
- Psylla*, in Greenland, RÜBSAAMEN, pp. 110–115, Bibl. Zool. xx.
- P. lidgetti*, Victoria, MASKELL, p. 5, pl. i, figg. 1–4, Tr. Soc. S. Austral. xxii, n. sp.

Trioza: *Ascelis multitudinea*, referred to this, described and figured, MASKELL, p. 8, pl. iii, figg. 11–17, Tr. Soc. S. Austral. xxii.

APHIDIDÆ.

[Cf. ADELUNG (5), LOWE (796), MARCHAL (817), MILLARDET (860), MORDWILKO (875), PERGANDE (933), RÜBSAAMEN (1050), THEOBALD (1207), ZEHNTNER (1337).]

Cholodkovsky's views on polymorphism, MARCHAL (817).

The biology of various species of *Aphidæ* and *Pemphigidæ*, MORDWILKO (875).

Summary of Mordwilko's paper, Zool. Rec. xxxiv, Ins. Titles (774), ADELUNG (5).

Dispersal of *Aphidæ*, TUTT, p. 233, Ent. Rec. x.

Absence of *Aphidæ* in Brazil, IHERING, p. 398, Revist. Mus. Paulista, ii.

Aphis sacchari, *adusta*, Java, on sugar-cane, ZEHNTNER (1337), n. spp.

Callipterus quercus, winged male, BIGNELL, p. 6, Ent. Mag. 1898.

Ceratozacuna, n. g., for *C. lanigera*, n. sp., Java on sugar-cane, ZEHNTNER (1337).

Cladobius populneus in Greenland, RÜBSAAMEN, p. 116, Bibl. Zool. xx.

Nectarophora tabaci, N. America, PERGANDE, p. 300, Canad. Ent. xxx, n. spp.

Phylloxera: study of vine-roots attacked by, MILLARDET (860).

Schizoneura lanigera; the cycle of development, MOKRZHETSKI, pp. 78–81, Bull. Dep. Agric. Ent. xviii; natural history, ALWOOD, p. 369, P. Amer. Ass. xlvii; *S. lanigera*, *fodiens*, notes on, THEOBALD, pp. 15–21, J. S. Eastern Agric. Coll. No. 6.

Tetraneura lucifuga, Java, ZEHNTNER (1337), n. sp.

Tychea grœnlandica, Greenland, RÜBSAAMEN, p. 115, pl. v, fig. 2, Bibl. Zool. xx, n. sp.

ALEURODIDÆ.

[Cf. COCKERELL (218, 219), IHERING (590), ZEHNTNER (1336, 1337).]

Aleurodes bergi, habits, metamorphosis, ZEHNTNER (1336).

A. lactea, Java, ZEHNTNER (1337); *A. gelatinosus*, New Mexico, COCKERELL, p. 264, Canad. Ent. xxx; *A. mirabilis*, *vinsonioides*, Mexico, COCKERELL, p. 225, Psyche, viii; *A. cockerelli*, Brazil, IHERING, p. 393, Revist. Mus. Paulista, ii: n. spp.

Aleurodiscus iridescens, Mexico, COCKERELL, p. 225, Psyche, viii, n. sp.

COCCIDÆ.

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Classification of *Coccidæ*, tribes and list of genera, BERLESE & LEONARDI (80).

Australian Brachyscelid galls, FROGGATT (421).

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Directions for collecting and preserving *Coccidæ*, COCKERELL (220).

Brief list of *Coccidæ* of Brazil, COCKERELL (231).

Aclerda berlesii, Italy, BUFFA, p. 139; with anatomy and instars, pp. 140–156, Rivist. Patol. Veg. vi, n. sp.

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Aonidia elæagnus, Japan, MASKELL, p. 227, pl. xxiii, figg. 2, 3, n. sp.

Ascelis multitudinea Tepp., cf. *Trioza* in *Psyllidæ*.

Aspidiella, subg. n. of *Aspidiotus*, LEONARDI, p. 220, Rivist. Patol. Veg. vi.

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Aspidiotus perniciosus; SMITH (1147), THEOBALD (1206); natural history, present distribution, HOWARD (571); *A. perniciosus* in Australia, TRYON (1228); in Maryland, JOHNSON (622).

A. britannicus, England on *Ilex*, NEWSTEAD, p. 93, Ent. Mag. 1898; *A. bilobis*, p. 225, pl. xxxiii, fig. 1, *implicatus*, p. 226, China, MASKELL, Tr. N. Zealand Inst. xxx; *A. sacchari-caulis*, Java, ZEHTNER (1336); *A. darutyi*, Mauritius, EMMEREZ, p. 278, Bull. Soc. ent. France, 1898; *A. forbesi*, p. 380, pl. xxix, figg. 1–5, *comstocki*, p. 383, pl. xxx, *æsculi*, p. 386, pl. xxxi, fig. 3, *ulmi*, p. 388, pl. xxxii, figg. 4, 5, N. America, JOHNSON, Bull. Illinois Lab. iv; *A. dearnessi*, Lake Huron, COCKERELL, p. 266, Canad. Ent. xxx; *A. fernaldi*, Massachusetts, COCKERELL, p. 323, Ann. Nat. Hist. (vii) ii; *A. (Odonaspis) bambusarum*, San Francisco on Bamboo from Japan, COCKERELL, p. 191, Psyche, viii; *A. (Diaspidiotus) coniferarum*, New Mexico, COCKERELL, p. 201, Psyche, viii; *A. yuccarum*, p. 25, *A. (Chrysomphalus) lilacinus*, p. 26, New Mexico, COCKERELL, Ann. Nat. Hist. (vii) ii; *A. (Chrysomphalus) albopictus*, Mexico, COCKERELL, p. 433, Ann. Nat. Hist. (vii) i; *A. (Pseudodiaspis) dentilobis*, p. 438, *A. (Chrysomphalus) longissimus*, p. 439, *calurus*, p. 440, Mexico, COCKERELL, t. c.; *A. jatrophæ*, *agavis*, p. 178, *koebelæi*, p. 179, Mexico, TOWNSEND & COCKERELL, J. N. York ent. Soc. vi: n. spp.

Aspidistus persearum, Sandwich islands, COCKERELL, p. 240, Entomologist, 1898, n. sp.

Asterolecanium rhamni, Algeria, in galls, KIEFFER, p. 214, Bull. Soc. ent. France, 1898, n. sp.

Aulacaspis miranda, Mexico, COCKERELL, p. 437, Ann. Nat. Hist. (vii) i, n. sp.

Bergrothiella, n. n. for *Bergrothia* Kr., REITTER, p. 54, Wien. ent. Zeit. xvii.

Brachyscelis urnalis, galls, ♀, p. 371, *B. pileata* young, p. 372, pl. viii, fig. 1, *variabilis* young, p. 374, FROGGATT, P. Linn. Soc. N. S. Wales, xxiii.

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- Cerococcus corticis*, Mexico, TOWNSEND & COCKERELL, p. 170, *t. c.*, n. sp.
- Ceronema japonicum*, Japan and India, MASKELL, p. 235, pl. xxv, figg. 3-9, Tr. N. Zealand Inst. xxx, n. sp.
- Ceroplastes vinsonii*, note and figure, MASKELL, p. 235, pl. xxv, figg. 1, 2, *t. c.*
- Ceroplastes personatus*, W. Africa, NEWSTEAD, p. 94, Ent. Mag. 1898 ; *C. minutus, angulatus*, p. 434, *coloratus*, p. 435, Mexico, COCKERELL, Ann. Nat. Hist. (vii) i ; *C. roseatus*, Mexico, TOWNSEND & COCKERELL, p. 176, J. N. York ent. Soc. vi ; *C. confluens*, Jamaica, COCKERELL & TINSLEY, p. 468, J. Inst. Jamaica, ii : n. spp.
- Chætococcus*, n. g., p. 249, for *Sphærococcus bambusæ* M., and *C. graminis*, n. sp., China, p. 250, pl. xxvii, figg. 17-19, MASKELL, Tr. N. Zealand Inst. xxx.
- Chentraspis*, n. g. for part of *Aspidiotus*, LEONARDI, p. 284, Rivist. Patol. Veg. v ; characters, LEONARDI, p. 111, *op. cit.* vi.
- Chionaspis lintneri* var. n. *betulæ*, COOLEY, p. 85, Canad. Ent. xxx ; *C. ortholobis bruneri*, n. subsp., COCKERELL, p. 133, *t. c.* ; *C.*, sp. in Mauritius, EMMEREZ (348).
- C. berlesii*, Italy, LEONARDI, p. 275, Rivist. Patol. Veg. vi ; *C. sacchari-folii, depressa*, Java, ZEHTNER (1336) ; *C. caryæ*, N. America, p. 86, Lounsburyi, S. Africa, p. 87, *howardi*, E. India, p. 88, COOLEY, Canad. Ent. xxx ; *C. americana*, Illinois, JOHNSON, p. 390, pl. xxxiii, Bull. Illinois Lab. iv : n. spp.
- Cocomytilus*, n. g. (with subg. *Allantomytilus*) for part of *Mytilaspis*, LEONARDI, p. 205, Rivist. Patol. Veg. vi.
- Coccus tomentosus* subsp. n. *newsteadii*, COCKERELL, p. 675, Science, viii.
- Ctenochiton aztecus*, Mexico, TOWNSEND & COCKERELL, p. 176, J. N. York ent. Soc. vi, n. sp.
- Dactylopius graminis* var. n. *orientalis*, MASKELL, p. 245, Tr. N. Zealand Inst. xxx ; *D. kingii*, var. n. *neomexicana*, TINSLEY, p. 318, Canad. Ent. xxx ; *D. virgatus*=(*ceriferus* Newst.), TINSLEY, p. 222, *t. c.* ; *D. longifilis*, great destruction by parasites, NEWSTEAD, p. 98, Ent. Mag. 1898.
- D. syringæ*, Japan, MASKELL, p. 246, pl. xxvii, figg. 7, 8, Tr. N. Zealand Inst. xxx ; *D. azaleæ*, California, in nursery, TINSLEY, p. 319, Canad. Ent. xxx ; *D. cockerelli*, Massachusetts, in ant-nest, KING & TINSLEY, p. 297, Psyche, viii ; *D. quaintancii*, Florida, TINSLEY, p. 220, Canad. Ent. xxx : n. spp.
- Diaspis amygdali*=(*Chionaspis prunicola*), COOLEY, p. 232, Canad. Ent. xxx ; *D. amygdali*, note on, LOUNSBURY, p. 269, *t. c.* ; *D. rosæ* var. n. *spinosa, amygdali* var. n. *rubra*, MASKELL, p. 228, Tr. N. Zealand Inst. xxx.
- D. gennadii*, Greece, LEONARDI, p. 273, Rivist. Patol. Veg. vi ; *D. crawii*, San Francisco, on plant from China, COCKERELL, p. 190, Psyche, viii ; *D. phoradendri*, Mexico, COCKERELL, p. 437, Ann. Nat. Hist. (vii) i ; *D. baccharidis*, Mexico, TOWNSEND & COCKERELL, p. 179, J. N. York ent. Soc. vi : n. spp.
- Ericerus pela*, account of, SMITHERS (1159).
- Eriococcus graminis*, pl. xxvii, figg. 1-3, *exiguus*, figg. 4-6, p. 243 ; *E. paradoxus* var. n. *simplex*, p. 244, MASKELL, Tr. N. Zealand Inst. xxx ; *E. tinsleyi*, ♂, etc., TINSLEY, p. 317, Canad. Ent. xxx.
- E. greeni*, Devon, NEWSTEAD, p. 96, Ent. Mag. 1898 ; *E. adenostomæ*, California, EHRHORN, p. 244, Canad. Ent. xxx ; *E. tinsleyi*, New Mexico, COCKERELL, p. 247, *t. c.* : n. spp.
- Evaspidiotus*, subg. n. of *Aspidiotus*, LEONARDI, p. 232, Rivist. Patol. veg. vi.
- Fiorinia signata*, p. 231, pl. xxiii, figg. 7-9, *tenuis*, p. 232, fig. 10, Japan, *bambusæ*, p. 233, pl. xxiv, figg. 1-5, *nephelii*, p. 234, figg. 6-10, China, MASKELL, Tr. N. Zealand Inst. xxx, n. spp.

- Gymnaspis*, n. g., near *Aonidia*, for *G. æchmeæ*, n. sp., Kew Gardens, NEWSTEAD, p. 92, Ent. Mag. 1898.
- Icerya*: notes on Mexican, TOWNSEND & COCKERELL, pp. 165–169, J. N. York ent. Soc. vi; *I. littoralis* var. n. *mimosæ*, COCKERELL, p. 430, Ann. Nat. Hist. (vii) i; *I. seychellarum*, habits, EMMEREZ (347); *I. seychellarum*, never attacks sugar-cane, MASKELL, p. 220, Tr. N. Zealand Inst. xxx; *I. seychellarum* var. n. *albolutea*, COCKERELL, p. 259, Entomologist, 1898.
- I. (Proticerya) littoralis*, Mexico, COCKERELL, p. 429, Ann. Nat. Hist. (vii) i, n. sp.
- Idiococcinæ*, characters amended, MASKELL, p. 246, Tr. N. Zealand Inst. xxx.
- Inglisia malvacearum*, Mexico, COCKERELL, p. 432, Ann. Nat. Hist. (vii) i, n. sp.
- Kermes nivalis*, *kingii*, Massachusetts, COCKERELL, p. 330, *op. cit.* (vii) ii; *K. pubescens*, BOGUE, *cocinnulus*, COCKERELL, p. 172, Kansas, Canad. Ent. xxx; *K. cockerelli*, p. 185, *nigropunctatus*, p. 186, California, EHRHORN, Ent. News Philad. 1898; *K. grandis*, Mexico, COCKERELL, p. 431, Ann. Nat. Hist. (vii) i : n. spp.
- Lecanium viride* var. n. *africanum*, NEWSTEAD, p. 95, Ent. Mag. 1898; *L. tulipiferæ*, note on, SMITH, p. 465, Report, 1898; *L. quercus*, p. 138, *robiniarum*, p. 141, natural history, HENRY, Feuille Natural. xxviii.
- L. perlatum*, Azores, COCKERELL, p. 65, Entomologist, 1898; *L. strachani*, Lagos, COCKERELL, p. 259, Entomologist, 1898; *L. ficus*, China, p. 237, pl. xxv, figg. 10, 11, *notatum*, Japan, figg. 12–15, *globulosum*, China, pl. xxvi, figg. 1, 2, p. 238, *melaleucæ*, figg. 3–8, p. 239, *casuarinæ*, figg. 9–14, p. 240, Australia, MASKELL, Tr. N. Zealand Inst. xxx; *L. krugeri*, Java, ZEHTNER (1337); *L. (Eulecanium) caryarum*, p. 293, *maclurarum*, p. 294, Canada, COCKERELL, Canad. Ent. xxx; *L. pubescens*, p. 244, *crawii*, *ventrale*, p. 245, North America, EHRHORN, t. c.; *L. magnoliarum*, N. America, from Japanese plants, COCKERELL, p. 145, Ent. News Philad. 1898; *L. (Eulecanium) kingii*, Massachusetts, COCKERELL, p. 322, Ann. Nat. Hist. (vii) ii; *L. nigrofasciatum*, N. America, PERGANDE, p. 26, Bull. Dep. Agric. Ent. xviii; *L. (Calymnatus) impar*, *L. (Eulecanium) subaustrale*, p. 131, *L. (Toumeyella) tubuliferum*, Mexico, *L. perconvexum*, Brazil, COCKERELL, Entomologist, 1898; *L. townsendi*, Mexico, COCKERELL, p. 433, Ann. Nat. Hist. (vii) i; *L. (Saissetia) castilloæ*, *L. (Pseudokermes) armatum*, Mexico, COCKERELL, p. 436, t. c.; *L. tuberculatum*, Mexico, TOWNSEND & COCKERELL, p. 177, J. N. York ent. Soc. vi; *L. erythrinæ*, Brazil, IHERING, p. 407, Revist. Mus. Paulista, ii : n. spp.
- Lichtensia crescentiæ*, Mexico, COCKERELL, p. 435, Ann. Nat. Hist. (vii) i; *L. mimosæ*, Mexico, TOWNSEND & COCKERELL, p. 175, J. N. York ent. Soc. vi : n. spp.
- Mallococcus*, n. n. for *Mallophora* M., MASKELL, p. 242, Tr. N. Zealand Inst. xxx.
- Mytilaspis*, divided, LEONARDI, p. 205, Rivist. Patol. veg. vi; *M. alba*, var. *concolor* is really a distinct species, COCKERELL, p. 263, Psyche, viii; *M.*, sp. injurious to beech, HENRY, p. 144, Feuille. Natural. xxviii.
- M. serrifrons*, Padua, LEONARDI, p. 276, Rivist. Patol. veg. vi; *M. machili*, Japan, MASKELL, pl. xxiii, fig. 5, p. 230, Tr. N. Zealand Inst. xxx; *M. mexicana*, *cuantla*, COCKERELL, p. 438, Ann. Nat. Hist. (vii) i; *M. perlonga*, Brazil, COCKERELL, p. 202, Psyche, viii : n. spp.
- Odonaspis*, n. g. for part of *Aspidiotus*, LEONARDI, p. 284, Rivist. Patol. veg. v.
- Opisthoscelis nigra*, p. 376, pl. ix, figg. 11–15, Australia, FROGGATT, P. Linn. Soc. N. S. Wales, xxiii, n. sp.
- Orthezia*; synonymy, habits, bibliographic notes, GIARD, pp. 8–12, Bull. Soc. ent. France, 1898; *O. urticæ*, noticed, KIEFFER, p. 158, t. c.

- O. cheilanthi*, p. 12, *graminis*, p. 13, New Mexico, TINSLEY, Canad. Ent. xxx; *O. artemisiæ*, New Mexico, COCKERELL, p. 19, Canad. Ent. xxx; *O. garryæ*, p. 401, *monticola*, p. 402, New Mexico, COCKERELL, Ann. Nat. Hist. (vii) ii : n. spp.
- Ortonia mexicanorum*, Mexico, COCKERELL, p. 430, Ann. Nat. Hist. (vii) i; *O. (Protortonia subg. n.) primitiva*, Mexico, TOWNSEND, p. 169, J. N. York ent. Soc. vi : n. spp.
- Parlatoria proteus* var. n. *palmae*, MASKELL, p. 229, Tr. N. Zealand Inst. xxx.
- P. sinensis*, China, MASKELL, p. 228, Tr. N. Zealand Inst. xxx, n. sp.
- Phaulaspis*, n. g. for part of *Aspidiotus*, LEONARDI, p. 284, Rivist. Patol. veg. v.
- Phaulomytilus*, n. g. for part of *Mytilaspis*, LEONARDI, p. 205, Rivist. Patol. veg. vi.
- Phenacoccus solenopsis*, male, TINSLEY, p. 319, Canad. Ent. xxx.
- P. minimus*, Colorado, TINSLEY, p. 223, *t. c.*; *P. solenopsis*, New Mexico, TINSLEY, p. 47, *t. c.*; *P. gossypii*, Mexico, TOWNSEND & COCKERELL, p. 170, J. N. York ent. Soc. vi : n. spp.
- Poliaspis pini*, Japan, MASKELL, p. 231, pl. xxiii, fig. 6, Tr. N. Zealand Inst. xxx, n. sp.
- Porococcus*, n. g. near *Solenophora*, p. 426, for *P. tinctorius*, *pergandei*, n. spp., Mexico, p. 427, COCKERELL, Ann. Nat. Hist. (vii) i.
- Prosopophora manihotis*, Mexico, TOWNSEND, p. 172, J. N. York ent. Soc. vi, n. sp.
- Protodiaspis*, n. g. *Diaspinæ*, for *P. parvulus*, n. sp., Mexico, COCKERELL, p. 428, Ann. Nat. Hist. (vii) i.
- Protortonia*, subg. n., cf. *Ortonia*.
- Pseudoparlatoria serrulata*, Mexico, TOWNSEND & COCKERELL, p. 180, J. N. York ent. Soc. vi; *P. noacki*, Brazil, COCKERELL, p. 201, Psyche, viii : n. spp.
- Pulvinaria innumerabilis tilia*, n. subsp., KING & COCKERELL, p. 286, Psyche, viii.
- P. newsteadii*, Madeira, LEONARDI, p. 279, Rivist. Patol. veg. vi; *P. rhois*, California, EHRHORN, p. 186, Ent. News Philad. 1898; *P. ephedrae*, New Mexico, COCKERELL, p. 24, Ann. Nat. Hist. (vii) ii; *P. marmorata*, New Mexico, COCKERELL, p. 130, Entomologist, 1898 : n. spp.
- Ripersia filicicola*, on *Trichomanes*, Kew Gardens, p. 96, *montana*, Savoy, p. 97, NEWSTEAD, Ent. Mag. 1898, n. spp.
- Solenophora coloradensis*, N. America, COCKERELL, p. 262, Psyche, viii; *S. koebelei*, Mexico, COCKERELL, p. 429, Ann. Nat. Hist. (vii) i : n. spp.
- Spatheapsis*, n. g. to replace *Odonaspis* (supra), LEONARDI, p. 115, *op. cit.* vi.
- Sphaerococcus parvus*, p. 247, pl. xxvii, figg. 9-11, *populi*, p. 248, figg. 12-16, Japan, MASKELL, Tr. N. Zealand Inst. xxx; *S. ferrugineus*, Queensland, FROGGATT, p. 378, pl. ix, figg. 16-20, P. Linn. Soc. N. S. Wales, xxiii; *S. sylvestris*, Massachusetts, COCKERELL & KING, p. 326, Canad. Ent. xxx : n. spp.
- Tachardia fulvoradiata*, Mexico, COCKERELL, p. 431, Ann. Nat. Hist. (vii) i; *T. nigra*, Mexico, TOWNSEND & COCKERELL, p. 172, J. N. York ent. Soc. vi : n. spp.
- Trichomytilus*, n. g. for part of *Mytilaspis*, LEONARDI, p. 205, Rivist. Patol. Veg. vi.
- Xylococcinæ*, subfam. n. for *Xylococcus* and *Celostoma*, PERGANDE, p. 26, Bull. Dep. Agric. Ent. xviii.
- Xylococcus betulæ*, N. America (habits, peculiar metamorphosis), HUBBARD & PERGANDE, pp. 13-26, *t. c.*, n. sp.

(F). *NEUROPTERA.*Fossil *Neuroptera*, MEUNIER (850).

TRICHOPTERA.

[Cf. BANKS (50), Klapálek (679), McLachlan (840), Morton (878).]

Agarodes, n. g., p. 217, *Rhyacophilidæ*, for *A. grisea*, n. sp., New York, p. 218, BANKS, Tr. Amer. ent. Soc. xxv.*Anabolia decepta*, Washington, BANKS, p. 208, *t. c.*, n. sp.*Catadice tenella*, Hungary, Klapálek, p. 488, Termes. Fuzetek, xxi, n. sp.*Chilostigma pallida*, New York, BANKS, p. 209, Tr. Amer. ent. Soc. xxv, n. sp.*Cyrnus insolutus* = (*fenestratus* Ris) characters, McLachlan, p. 50, Ent. Mag. 1898.*Drusus brunneus*, Hungary, Klapálek, p. 489, Termes. Fuzetek, xxi, n. sp.*Goera calcarata*, New York, BANKS, p. 211, Tr. Amer. ent. Soc. xxv, n. sp.*Goniotaulius coloradensis*, N. America, BANKS, p. 208, *t. c.*, n. sp.*Halesus magnifica*, Washington, BANKS, p. 209, *t. c.*, n. sp.*Helicopsyche californica*, N. America, BANKS, p. 210, *t. c.*, n. sp.*Hydropsyche gracilis*, p. 216, *californica*, p. 217, N. America, BANKS, *t. c.*, n. spp.*Hydroptila sylvestris*, Scotland, p. 107, *serrata*, Bône, p. 108, MORTON, Ent. Mag. 1898, n. spp.*Leptocella*, n. g., p. 214, *Leptoceridæ*, for *L. coloradensis*, n. sp., N. America, p. 215, BANKS, Tr. Amer. ent. Soc. xxv.*Leptocerus maculatus*, Washington, BANKS, p. 214, *t. c.*, n. sp.*Limnophilus centralis*, var. *italicus* probably a good species, McLachlan, p. 47, Ent. Mag. 1898.*L. ponticus*, Asia minor, McLachlan, p. 46, *t. c.*; *L. pacificus*, *luteolus*, *concolor*, N. America, BANKS, p. 207, Tr. Amer. ent. Soc. xxv : n. spp.*Mormonia pictilis*, N. America, BANKS, p. 211, *t. c.*, n. sp.*Nerophilus*, n. g., p. 211, *Sericostomatidæ*, for *N. oregonensis*, n. sp., N. America, p. 212, BANKS, *t. c.**Æcetina*, n. g. *Leptoceridæ*, type *incerta* Walk., with *Æ. parvula*, p. 215, *flavida*, *fumosa*, *floridana*, n. spp., N. America, BANKS, *t. c.**Oligoplectrum americanum*, New Hampshire, BANKS, p. 210, *t. c.*, n. sp.*Pristosilo*, n. g. *Sericostomatidæ* for *P. canadensis*, n. sp., Sherbrooke, BANKS, p. 212, *t. c.**Psilotreta*, n. g. *Sericostomatidæ* for *P. frontalis*, n. sp., New York, p. 213, BANKS, *t. c.**Psychomyia pulchella*, Colorado, BANKS, p. 217, *t. c.*, n. sp.*Rhyacophila apennina*, Italy, McLachlan, p. 51, Ent. Mag. 1898; *R. mocsaryi*, *flava*, Hungary, Klapálek, p. 489, Termes. Fuzetek, xxi : n. spp.*Schizopelex granjae*, is var. of *festiva*, McLachlan, p. 50, Ent. Mag. 1898.*Sericostoma flavicorne*, *selysii*, characters, figg., McLachlan, p. 49, *t. c.**S. mesopotamicum*, Malatia, *subaequale*, Europe, McLachlan, p. 49, *t. c.*, n. spp.

- Setodes americana*, Washington, BANKS, p. 215, Tr. Amer. ent. Soc. xxv, n. sp.
Silo cinereus, California, BANKS, p. 210, *t. c.*, n. sp.
Stenophylax millenii, Hungary, KLAPÁLEK, p. 488, Termes. Fuzetek, xxi;
S. brevipennis, Colorado, BANKS, p. 209, Tr. Amer. ent. Soc. xxv : n. spp.
Triadenodes grisea, Colorado, BANKS, p. 214, *t. c.*, n. sp.

NEUROPTERA-PLANIPENNIA.

[*Cf.* BANKS (50), CURRIE (281), KOLBE (691), LURIÉ (801), McLACHLAN (837, 839).]

HEMEROBIIDÆ.

On the natural history of *Chrysopa*, in Russian, LURIÉ (801).

- Berotha eatoni*, Biskra, McLACHLAN, p. 162, Tr. ent. Soc. London, 1898, n. sp.
Brachynemurus and *Myrmeleon*, distinguished, p. 202, table of the species of *Brachynemurus*, pp. 205, 206, BANKS, Tr. Amer. Ent. Soc. xxv.
B. minusculus, p. 203, *centralis*, *tenuis*, p. 204, N. America, BANKS, Tr. Amer. ent. Soc. xxv; *B. hubbardii*, N. America, *id.*, p. 241, *t. c.*; *B. brunneus*, *id.*, p. 273, *t. c.*; *B. niger*, p. 134, *quadripunctatus*, p. 136, N. America, CURRIE, *t. c.*; *B. coquilletti*, N. America, CURRIE, p. 93, Canad. Ent. xxx : n. spp.
Bubopsis, n. n. for *Bubo* Rambur, McLACHLAN, p. 159, Tr. ent. Soc. London, 1898.
B. eatoni, p. 159, *gravidus*, p. 160, Algeria, *id.*, *t. c.*, n. spp.
Chrysopa nana = (*pretiosa* Gerst.), McLACHLAN, p. 166, *t. c.*
C. caviceps, p. 165, *mutata*, p. 167, Algeria, McLACHLAN, Tr. ent. Soc. London, 1898; *C. erythrocephala*, California, p. 201, *assimilis*, Oregon, p. 202, BANKS, Tr. Amer. ent. Soc. xxv : n. spp.
Coniopteryx barretti, Mexico, BANKS, p. 202, *t. c.*, n. sp.
Macronemurus elegantulus, Algeria, McLACHLAN, p. 155, Tr. ent. Soc. London, 1898, n. sp.
Meleoma mexicana, Amecameca, BANKS, p. 201, Tr. Amer. ent. Soc. xxv, n. sp.
Myrmeleon microstenus, Algeria, McLACHLAN, p. 157, Tr. ent. Soc. London, 1898; *M. distans*, California, BANKS, p. 206, Tr. Amer. ent. Soc. xxv : n. spp.
Palpares angustus, with var. *oranensis*, Algeria, McLACHLAN, p. 152, Tr. ent. Soc. London, 1898; *P. krugi*, Africa and Arabia, p. 230, *hamatus*, p. 232, *abyssinicus*, Abyssinia, *umbrosus*, p. 233, *sylphis*, p. 234, W. Africa, KOLBE, Ent. Zeit. Stettin, lix : n. spp.

NEMOPTERIDÆ and MANTISPIDÆ.

- Croce chobauti*, Algeria, p. 169, *damarae*, S. Africa, p. 170, McLACHLAN, Bull. Soc. ent. France, 1898, n. spp.
Mantispa styriaca, larval habits, POUJADE, p. 347, Bull. Soc. ent. France, 1898.

PSEUDO-NEUROPTERA.

MALLOPHAGA.

Query as to the mode of transfer of *Mallophaga* from one species of bird to another, KELLOGG, *Psyche*, viii, pp. 243–247.
List of the *Mallophaga* of Hungary, HORVÁTH (563).

TERMITIDÆ.

[*Cf.* CZERVINSKY (283), FROGGATT (420), SJÖSTEDT (1140, 1141), TSCHERVINSKY (1229).]

Notes on anatomy, TSCHERVINSKY (1229).

Frontal glands in the castes; sympathetic nervous system, CZERVINSKY (283).

Australian Termitidæ, part III, Systematic, concluded, FROGGATT, P. Linn. Soc. N. S. Wales, 1897, pp. 721–758, Plates xxxiv, xxxv.

Eutermes magnus, p. 742, *triodia*, p. 745, *tumuli*, p. 747, *pyriformis*, p. 750, *hastilis*, p. 751, Australia, FROGGATT, P. Linn. Soc. N. S. Wales, 1897, n. spp.

Termes niger, Cameroons, SJÖSTEDT, Ent. Tidskr. xix, p. 128; *T. acanthothorax*, p. 204, *mulleri*, p. 205, W. Africa, SJÖSTEDT, *t. c.*; *T. ferox*, p. 724, *meridionalis*, p. 726, *paradoxus*, p. 728, *rubriceps*, p. 730, *serratus*, p. 731, *krisiformis*, p. 732, *errabundus*, p. 733, *perniger*, p. 734, *turneri*, p. 736, *acinaciformis*, p. 740, Australia, FROGGATT, P. Linn. Soc. N. S. Wales, 1897 : n. spp.

PERLIDÆ.

[*Cf.* BANKS (50), KEMPNY (642, 643).]

Sexual characters etc. in *Leuctra*, KEMPNY, pp. 214, 215, pl. iii, Verh. Ges. Wien, 1898.

Mode of preservation of *Perlida*, KEMPNY, p. 66, *t. c.*

Chloroperla coloradensis, *montana*, *virginica*, N. America, BANKS, p. 199, Tr. Amer. Ent. Soc. xxv, n. spp.

Isopteryx torrentium, *burmeisteri*, characters, MORTON, p. 158, Ent. Mag. 1898.

Leuctra klapaleki, p. 217, *braueri*, p. 219, *handlirschi*, p. 220, Austria, KEMPNY, Verh. Ges. Wien, 1898, n. spp.

Nemura; palæarctic species and their sexual characters, KEMPNY, pp. 37–68, pl. i, *t. c.*; *N. depressa*, Oregon, BANKS, p. 200, Tr. Amer. ent. Soc. xxv : n. spp.

Nemurella, subg. n. of *Nemura*, for *N. inconspicua* Pict., KEMPNY, p. 50, *t. c.*

Protonemura, subg. n. of *Nemura*, KEMPNY, p. 49, *t. c.*

EPHEMERIDÆ.

Mode of effecting the last aquatic ecdysis, CAUSARD (193).

Swarm of *Ephemera virgo*, LETACQ (775).

Baëtis nubecularis, Jura, EATON, p. 265, Ent. Mag. 1898, n. sp.

ODONATA.

[Cf. BAUMANN (58), BENTIVOGLIO (64), CALVERT (177-179), FÖRSTER (405, 406), HARVEY (529), INGENITZKY (593), KIRBY (669, 670), KRÜGER (732, 733), MARTIN (827), MATSUMURA (834), McLACHLAN (838, 841), NEEDHAM (883), RIS (1030), SELYS (1108), TüMPPEL (1243), VOINOV (1271, 1272), WILLIAMSON (1327).]

Review, from inspection, of Burmeister's Types, with many descriptive and taxonomic notes, CALVERT (177).

The venation of the wings of *Odonata*; nymphs etc., COMSTOCK & NEEDHAM, Amer. Natural. xxxii, pp. 903-911.

The first filling of larval tracheae with air, CALVERT, p. 73, Ent. News Philad. 1898.

Digestion and fat-body in larvae, VOINOV (1272).

Epithelium of alimentary canal of nymphs, process of digestion, VOINOV (1271); digestive epithelium of nymphs, NEEDHAM (883).

First part of a work on Central European *Odonata* and *Orthoptera*, TüMPPEL (1243).

The *Agrionides* of Sumatra, discussed, with many descriptive and synonymical observations, KRÜGER, pp. 64-130, Ent. Zeit. Stettin, lix.

Acisoma variegatum, Nyasaland, KIRBY, p. 239, Ann. Nat. Hist. (vii) ii, n. sp.

Æschna borealis, etc., synonymy, McLACHLAN, p. 226, Ent. Mag. 1898.

Æ. joannisi, Bolivia, MARTIN, p. 592, Ann. Soc. ent. France, lxvi, n. sp.

Agrionoptera karschii, New Guinea, p. 282, pl. xiii, figg. 3, 4, *salomonis*, Shortland islds. p. 284, FÖRSTER, Termes. Fuzetek, xxi.

Alloneura dohrni, Sumatra, p. 114, *fruhstorferi*, Java, p. 138, KRÜGER, Ent. Zeit. Stettin, lix, n. spp.

Amphicnemis gracilis, Sumatra, KRÜGER, p. 121, t. c., n. sp.

Amphilestes tricolor, Java, KRÜGER, p. 136, t. c., n. sp.

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A. macLachlani, New Guinea, FÖRSTER, p. 290, Pl. xiii, figg. 1, 2, Termes. Fuzetek, xxi, n. sp.

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D. constricta, S. America, CALVERT, p. 311, t. c.; *D. nigra*, Cayenne, *atra*, Minas Geraes, *flavopunctata*, Bolivia, MARTIN, p. 590, Ann. Soc. ent. France, lxvi : n. spp.

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- Gomphus scudderi* ♂, p. 62, pl. v, figg. 6–8, *nævius*, ♂, p. 63, figg. 2–5, 9, 10, HARVEY, Ent. News Philad. 1898.
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- Helieschna crassa*, Borneo, KRÜGER, p. 325, Ent. Zeit. Stettin, lix, n. sp.
- Heterogomphus sumatranus*, Sumatra, KRÜGER, p. 294, t. c., n. spp.
- Ictinus melanops* v. n. *sumatranus*, KRÜGER, p. 315, t. c.
- Ischnura denticolle* = (*exstriata* Calv.), CALVERT, p. 72, Ent. News Philad. 1898.
- I. inarmata*, Kashmir, CALVERT, p. 147, P. Ac. Philad. 1898; *I. kellicotti*, Indiana, WILLIAMSON, p. 209, Pl. xi, CALVERT, pp. 212, 213, Ent. News Philad. 1898 : n. spp.
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- Isosticta filiformis*, Bismarck Arch., RIS, p. 325, Ent. Nachr. xxiv, n. sp.
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- L. fujisana*, Japan, MATSUMURA, Annot. Zool. Japon. ii, p. 123, n. sp.
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- Micrathyria ocellata*, Ecuador, MARTIN, p. 589, Ann. Soc. ent. France, lxvi, n. sp.
- Micromerus signatus*, Penang and Java, KRÜGER, p. 86, Ent. Zeit. Stettin, lix, n. sp.
- Nesogonia*, n. g. for the Hawaiian, *Lepthemis blackburni*, KIRBY, p. 347, Ann. Nat. Hist. (vii) ii.
- Nesoxenia dahli*, Bismarck Archipel., RIS, p. 322, Ent. Nachr. xxiv; *N. puella*, Astrolable Bay, FÖRSTER, p. 284, Termes. Fuzetek, xxi : n. spp.
- Neurobasis australis* var. n. *paradisearum*, FÖRSTER, p. 296, Termes. Fuzetek, xxi; *N. chinensis* var. *kaupi*, hab. Celebes, SELYS, p. 338, Ann. Soc. ent. Belgique, xlii.
- Neurothemis paradisea*, New Guinea, FÖRSTER, p. 277, Termes. Fuzetek, xxi, n. sp.
- Onychogomphus hartmanni*, Transvaal, FÖRSTER, p. 166, Ent. Nachr. xxiv, n. sp.
- Ophiogomphus reductus*, Kashmir, CALVERT, p. 150, P. Ac. Philad. 1898; *O. anomalus*, Maine, HARVEY, p. 60, Ent. News Philad. 1898 : n. spp.
- Orthetrum wrightii* is a race of *stemmale*, CALVERT, p. 145, P. Ac. Philad. 1898.
- O. aequale*, Togo, BAUMANN, p. 343, Ent. Nachr. xxiv; *O. farinosum*,

- Transvaal, FÖRSTER, p. 169, Ent. Nachr. xxiv; *O. flavidulum*, Pretoria, KIRBY, p. 238, Ann. Nat. Hist. (vii) ii; *O. fenicheli*, New Guinea, FÖRSTER, p. 279, Termes. Fuzetek, xxi; *O. bismarckianum*, Bismarck Arch., RIS, p. 321, Ent. Nachr. xxiv : n. spp.
- Pallothemis lineatipes*, note, CALVERT, p. 312, P. Boston Soc. xxviii.
- Phyllomacromia flavicincta*, Transvaal, KIRBY, p. 241, Ann. Nat. Hist. (vii) ii, n. sp.
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- Pseudothemis nigrifrons*, Japan, MATSUMURA, p. 123, Annot. Zool. Japon. ii, n. sp.
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- Rhyothemis ducalis*, Nyasaland, KIRBY, p. 231, Ann. Nat. Hist. (vii) ii, n. sp.
- Sieboldius grandis*, Sumatra, KRÜGER, p. 311, Ent. Zeit. Stettin, lix, n. sp.
- Stechia*, n. g., p. 235, near *Corduliops* for *S. distant*, p. 236, n. sp., Pretoria, KIRBY, Ann. Nat. Hist. (vii) ii.
- Telebasis bicolor*, Banguay, p. 593, *tenuis*, N. Celebes, p. 594, MARTIN, Ann. Soc. ent. France, lxvi; *T. metallica*, New Guinea, FÖRSTER, p. 300, Termes. Fuzetek, xxi : n. spp.
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- Tramea*: *burmeisteri* K. probably not distinct from *basilaris*, CALVERT, p. 143, P. Ac. Philad. 1898; *T. carolina* and *Libellula basalis*, coupling, DAVIS, p. 197, J. N. York ent. Soc. vi; *T. loewi*, var. n. *biroi*, FÖRSTER, p. 273, Termes. Fuzetek, xxi.
- Trithemis trivialis* referred to *Diplacodes*, CALVERT, p. 146, P. Ac. Philad. 1898.
- Urothemis rendalli*, p. 234, *iridescens*, p. 235, Nyasaland, KIRBY, Ann. Nat. Hist. (vii) ii, n. spp.
- Xiphiagrion karschi*, Bismarck Arch., RIS, p. 326, Ent. Nachr. xxiv, n. sp.

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- Phlæothrips amplicincta*, Java, ZEHNTNER (1337), n. sp.
- Physopus sexnotatus*, Java, ZEHNTNER (1337), n. sp.

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- Isotoma viridis* var. n. *violaceus*, LIE-PETTERSEN, p. 12, Bergens Mus. Aarbog, 1898, No. 6; *I. palustris* var. n. *cincta*, KRAUSBAUER, p. 502, Zool. Anz. 1898.
- I. spitzbergenensis*, Dickson bay, Spitzb., LUBBOCK, p. 616, J. Linn. Soc. xxvi; *I. schafferi*, Nassau, KRAUSBAUER, p. 502, Zool. Anz. 1898; *I. semenkevitschi*, p. 63, *rhopalota*, p. 64, Kiew, SCHERBAKOW, t. c., and (1185) with figg.; *I. inæqualis*, New Britain, SCHÄFFER, p. 403, figg. 4, 5, Arch. Naturges. lxiv : n. spp.
- Lepidocyrtus pictus*, p. 415, figg. 15–18, *falcifer*, p. 416, figg. 23–26, *parvidentatus*, p. 417, figg. 27–29, *ralumensis*, p. 418, figg. 30–32, *dahlia*, p. 419, figg. 33, 34, 38, *medius*, p. 420, figg. 35–37, *cinctus*, p. 421, fig. 39, New Britain, SCHÄFFER, Arch. Naturges. lxiv, n. spp.
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- Mesira*, n. g., p. 62, near *Sira*, for *M. squamoornata*, n. sp., Kiew, p. 63, SCHERBAKOW, Zool. Anz. 1898 and (1185), p. 18.
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- Paronella dahlia*, p. 409, figg. 9–14, *picta*, p. 410, figg. 48–52, New Britain, SCHÄFFER, Arch. Naturges. lxiv, n. spp.
- Pettersenia*, n. n. for *Tullbergia* Pett. nec Lubb., SCHERBAKOW, p. 61, Zool. Anz. 1898; *P. ocellata*, redescribed, LIE-PETTERSEN, p. 10, pl., figg. 4–7, Bergens Mus. Aarbog, 1898, No. 6.
- Podurinae*, n. n. for a division of *Aphoruridae*, STERBAKOFF (1185), p. 4.
- Pseudachorutes dubius*, Nassau, KRAUSBAUER, p. 504, Zool. Anz. 1898, n. sp.
- Schottella dahlia*, figg. 1–3, 40, 41, *clavigera*, figg. 42–46, Bismarck Arch., SCHÄFFER, p. 400, Arch. Naturges. lxiv, n. spp.
- Sira*, generic characters, *S. platani* var. n. *argenteocincta*, KRAUSBAUER, p. 503, Zool. Anz. 1898.
- S. fasciata*, Nassau, KRAUSBAUER, p. 503, t. c.; *S. japonica*, Japan, FOLSOM, p. 55, pl., fig. 15, Bull. Essex Inst.; *S. fuscopicta*, New Britain, SCHÄFFER, p. 412, Arch. Naturges. lxiv; *S. mexicana*, Mexico, FOLSOM, p. 184, Psyche, viii : n. spp.
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- S. tuberculatus*, Norway, LIE-PETTERSEN, p. 5, Bergens Mus. Aarbog, 1898, No. 6; *S. pumilis*, p. 495, *signatus*, p. 496, *parvulus*, *assimilis*, p. 497, *speciosus*, *quinquefasciatus*, p. 498, Nassau, KRAUSBAUER, Zool. Anz. 1898; *S. vexillarius*, p. 422, figg. 53–56, *gracilicornis*, p. 423, New Britain, SCHÄFFER, Arch. Naturges. lxiv : n. spp.
- Tullbergia antarctica* at Kiew, notes on, SCHERBAKOW, p. 61, Zool. Anz. 1898.
- Xenylla longicauda*, Japan, FOLSOM, p. 53, pl., fig. 10, Bull. Essex Inst. xxix, n. sp.

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[*Cf.* ADELUNG (6), AZAM (35), BERG (67), BESSEY (84), BLACK (97), BLANCHARD (101), BLATCHLEY (103, 104), BOLIVAR (117 to 121), BORDAGE (124, 125), BORDAS (126), BRINDLEY (144), BRUNN (145), BRUNNER (146), BURR (151, 305), COCKERELL (217, 255), FINOT (391), GAHAN (438), GIARDINA (467), GIGLIO-TOS (468), GREEN (486) GRIFFINI (487, 488, 490, 491, 493), HANCOCK (523), HUTTON (585, 586, 589), KARSCH (635), KULWETZ (735 to 738), KÜNCKEL (739), LARBALÉTRIER (747), MARTINEZ (828), MORSE (877), PANTEL (927), PAVLOFF (931), SAUSSURE (1061, 474), SCHULTHESS (1082), SCUDDER (1097 to 1101), SHARP (1130), STADELMANN (1175), WALKER (1276, 1277), ZUBOWSKY (1343, 1344).]

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Stink-glands, KULWETZ (735), and p. 66, Zool. Anz. 1898.

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Calolampra aptera, Somaliland, SCHULTHESS, p. 169, pl. ii, fig. 2, Ann. Mus. Genova, xxxix, n. sp.

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- E. truncata*, Celebes, p. 207, *geminata*, Borneo, p. 208, BRUNNER, Abh. Senckenb. Ges. xxiv; *E. stigmata*, p. 8, *josephi*, p. 9, Ecuador, GIGLIO-TOS, Boll. Mus. Torino, xiii, No. 311 : n. spp.
- Eurycotis cothurnata*, Ecuador, GIGLIO-TOS, p. 11, *t. c.*, n. sp.
- Homalopterix intermedia*, New Guinea, BOLIVAR, p. 137, Act. Soc. Espan. 1898, n. sp.
- Ischnoptera picea*, Somaliland, SCHULTHESS, p. 166, Ann. Mus. Genova, xxxix; *I. hamata*, p. 4, *sancta*, p. 5, *josephina*, p. 6, Ecuador, GIGLIO-TOS, Boll. Mus. Torino, xiii, No. 311 : n. spp.
- Panchlora festæ*, Ecuador, GIGLIO-TOS, p. 12, *t. c.*, n. sp.
- Panesthia kheili*, New Guinea, BOLIVAR, p. 138, Act. Soc. Espan. 1898, n. sp.
- Paranauphæta rufipes*, var. *novæ guineæ*, BOLIVAR, p. 138, *t. c.*
- Periplaneta brunneriana*, Somaliland, SCHULTHESS, p. 167, Ann. Mus. Genova, xxxix; *P. methanoides*, Halmahera, BRUNNER, fig. 14, p. 209, Abh. Senckenb. Ges. xxiv : n. spp.
- Phyllodromia corommensis*, Somaliland, SCHULTHESS, p. 165, Ann. Mus. Genova, xxxix; *P. irregulariter-vittata*, fig. 1, *latius-vittata*, fig. 2, p. 202, Java, *rectangulariter-vittata*, fig. 3, *triangulariter-vittata*, fig. 4, Borneo, *molesta*, fig. 5, Java, p. 203, *nitens*, fig. 6, *castanea*, fig. 7, p. 204, *laticaput*, fig. 8, *longe-alata*, fig. 9, Borneo, *variegata*, fig. 10, Java, p. 205, *terminalis*, fig. 11, *puncticollis*, fig. 12, p. 206, *palpata*, fig. 13, p. 207, Borneo, BRUNNER, Abh. Senckenb. Ges. xxiv : n. spp.
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- Temnopteryx ferruginea*, Somaliland, SCHULTHESS, p. 165, Ann. Mus. Genova, xxxix, n. sp.
- Zetobora aberrans*, Ecuador, GIGLIO-TOS, p. 13, Boll. Mus. Torino, xiii, No. 311, n. sp.

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- Revision of the group *Harpagites* with tabulation and discrimination of the genera, SAUSSURE, pp. 196–211, Rev. Suisse Zool. v.
- The ootheca of *Mantis religiosa*, GIARDINA (467).
- The post-embryonic development of *Mantidæ*, with plate, PAVLOFF (931).
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- Bomistria*, n. g., p. 202, for *B. lunata*, n. sp., Gaboon, p. 203, but at p. 789 it is recognised that the genus is a synonym of *Chlidonoptera*, Karsch, and the species probably *C. vexillum*, SAUSSURE, Rev. Suisse Zool. v.
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- Elæa somalica*, Somaliland, SCHULTHESS, p. 170, Ann. Mus. Genova, xxxix, n. sp.
- Geomantis larvoides*, var. from France, AZAM, p. 59, Bull. Soc. ent. France, 1898.
- Hierodula atrocoxata*, fig. 15, Celebes, *tertiata*, fig. 16, Aru islands, p. 211, *purpurescens*, fig. 17, Celebes, *punctipectus*, fig. 18, New Guinea, New Britain, p. 212, *obtusata*, fig. 19, *modesta*, fig. 20, Celebes, p. 213, *reticulata*, fig. 22, Lombok, *stigmata*, fig. 21, p. 214, *notata*, fig. 22 A, p. 215, Borneo, BRUNNER, Abh. Senckenb. Ges. xxiv, n. spp.
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- Sigaüs*, n. g., for *S. piliferus*, n. sp., New Zealand, HUTTON, p. 140, Tr. N. Zealand Inst. xxx.
- Sinaloa behrensi*, Mexico, SCUDDER, p. 40, P. U. S. Mus. xx, n. sp.
- Stenobothrus fischeri* var. n. *glaucescens*, BOLIVAR, p. 227, Ann. Sci. Nat. Porto, iv; *S. panteli* var. n. *meridionalis*, BOLIVAR, p. 3, Ann. Sci. Nat. Porto, v; *S. æthalinus* n. n. for *fuliginosus* Zub. nec Iwan., ZUBOWSKY, p. 600, Horæ Soc. Ross. xxxii.
- S. antigai*, p. 3, *cazurroi*, p. 8, Spain, BOLIVAR, Ann. Sci. Nat. Porto, v; *S. eurasius*, p. 75, *ingenitzkyi*, p. 82, *dubius*, p. 85, *fuliginosus*, p. 87, Asiatic Russia, ZUBOWSKY, Annuaire Mus. St. Petersb. 1898; *S. latipennis*, Korea, BOLIVAR, p. 83, Ann. Mus. Genova, xxxix : n. spp.
- Stethophyma flavicosta* var. n. *crassiuscula*, ZUBOWSKY, p. 95, Annuaire Mus. St. Petersb. 1898.
- Stropis hospita*, Australia, BOLIVAR, p. 93, Ann. Mus. Genova, xxxix, n. sp.
- Tauchira buæ*, Engano, BOLIVAR, p. 92, t. c., n. sp.
- Traulia*: characters and position, BRUNNER, p. 246, Abh. Senckenb. Ges. xxiv.
- T. ferruginata*, Borneo, *oblique-annulata*, p. 249, *lineata*, p. 251, Sumatra, BRUNNER, t. c.; *T. stigmatica*, Sumatra, BOLIVAR, p. 100, Ann. Mus. Genova, xxxix : n. spp.
- Trigoniza tasmaniensis*, p. 94, *albertisi*, Tasmania, *australiensis*, Australia, p. 95, *manca*, Tasmania, p. 96, BOLIVAR, t. c.; *T. campestris*, *directa*, *rugosa*, New Zealand, HUTTON, p. 148, Tr. N. Zealand Inst. xxx : n. spp.
- Tritropis brunneri*, New Guinea, BOLIVAR, p. 94, Ann. Mus. Genova, xxxix, n. sp.
- Tryxalinæ*: table of N. American genera, SCUDDER, pp. 231–239, Psyche, viii.
- Turbaleus*, n. g., p. 234, near *Lentula*, for *T. pilosus*, fig. 35, Halmahera, *decoloratus*, Amboina, n. spp., p. 235, BRUNNER, Abh. Senckenb. Ges. xxiv.
- Tylotropidius somalicus*, Somaliland, SCHULTHESS, p. 195, Ann. Mus. Genova, xxxix, n. sp.
- Xistra tricristata*, Java, with var. *sumatrana*, BOLIVAR, p. 75, t. c., n. sp.
- Xomana*, n. g. for *Procolpia gonagra* and *nuptialis* Gerst., GIGLIO-TOS, p. 51, Boll. Mus. Torino, xiii, No. 311.

XIV. ECHINODERMA.

BY

F. A. BATHER.

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INTRODUCTION.

I. TITLES. Last year's Introduction admitted that the Record for 1896 and 1897 was incomplete. The publications come to hand since that Record went to press permit us to raise the number of titles for 1896 to 188, for 1897 to 176. No falling off is seen in the list for 1898, which already includes 167, and will no doubt eventually be found to equal or exceed the lists of preceding years. The total number of titles in the present Record, viz., 231, is thus made up: 1885, 1; 1887, 1; 1888, 1; 1891, 1; 1892, 2; 1893, 3; 1894, 3; 1895, 3; 1896, 20; 1897, 29; 1898, 167. The papers from the earlier years include some that have been very difficult of access, and this seems all the more reason why they should be recorded when at last obtainable. In addition to the titles now first recorded, further information is given concerning 57 papers or books previously noted.

Every attempt has been made to determine the true date of all publications alluded to. Thanks to the spread of education among editors, this is gradually becoming more easy. Still, however, there are people who seem to delight in a misleading date; and the annoyance caused by imperfect bibliographic information still detracts from one's pleasure at receiving an Author's reprint. For examples to be avoided, see under COULON, GREGORY, WHITEAVES.

Catch-numbers to the divisions of the Subject-Index are, as before, inserted in square brackets at the end of each title. Those referring to the Systematic portion [IV, A—K] are inserted only when some question of definite importance to the systematist is dealt with in the work.

The bulk of the Subject-Index is far less in proportion to the number of titles than was the case in the last volume. This is due in part to various alterations (improvements, it is hoped) in the arrangement of both matter and type. But it is more largely due to the absence of any great works, such as those by LUDWIG (210) and WACHSMUTH & SPRINGER (336) in last year's Record.

II. BIOLOGY. A. There are no general writings of special importance to the student of Echinoderms.

B. Anatomical research on the Holothurians is continued with valuable and suggestive results by ÖSTERGREN (165); while other matter of importance is found in CLARK's paper on *Synapta vivipara* (32), DENDY's on *Caudina* (45) and LUDWIG (135 & 137). In Echinoidea, KOEHLER (117) contributes new details on the anatomy of recent *Echinothuridae*; ST. HILAIRE's exhaustive account of the wandering cells (191) is unfortunately liable to be overlooked. Under Asteroidea, DOEDERLEIN's account of specimens collected by SEMON (50) is of singular interest to the student of skeletal structures; the "Krystallkörper" which he describes remind one of the "Glasplättchen" found by LUDWIG in *Ophiomyxa* and described in a paper (141) which also contains valuable notes on *Gorgonocephalus*. BATHER's review of Wachsmuth and Springer (15) deals at length with the comparative anatomy of the Crinoid skeleton. More special studies are by SPANDEL (201) on *Cyathocrinus* and BATHER (16) on *Petalocrinus*. The latter author (16A) introduces a new type of *Edrioasteroid* structure.

LAHILLE (126) again appears as a conscientious student of variation in an Echinoid. Interesting cases of meristic variation in Echinoids are discussed by CHADWICK (31) and OSBORN (164); in Ophiuroids by DOEDERLEIN (49); in *Holothuria* by LUDWIG (138); and in *Petalocrinus* by BATHER (16).

Several new cases of protection of the young in Holothurians are discussed by LUDWIG (136, 137).

C. The physiological observation of chief importance is the discovery by BORDAS (21) of urates in the respiratory trees of Holothurians. UEXKÜLL (208, 209) continues his experiments on Echinoids, dealing this time with sensation.

D. Numerous observations on Bionomics are referred to in the Subject-Index, but special attention may be directed to the thorough paper by PRUVOT (180) on the distribution and habitats of the Invertebrates in the Golfe du Lion and off the north coast of Brittany; and to VERNON's studies (212, 213) of the effects of environment on the growth of Echinoid larvae. The important subject of Regeneration has been studied experimentally by KING (114), while noteworthy observations on autotomy in Ophiurids are communicated by DOEDERLEIN (49) and SLUITER (199). To this section has been added a paragraph (x) on Echinoderms as Rock-formers, a study in which biologists are becoming as much interested as geologists: here comes the excellent work of CAYEUX (30) on the Chalk.

F. One of the most valuable papers of the year is that by MORTENSEN (156, 157) who attempts to apply the methods of the systematist to the larval forms of Echinoderms; the establishment of several new species upon plutei of which the adults are unknown may cause trouble; but as to the utility and thoroughness of MORTENSEN's descriptions there can be no doubt. An important embryological paper is that by H. L. CLARK (32) on *Synapta*. GOTO (81, 82) and MACBRIDE (142) will some day, it is to be hoped, give us a clear and consistent account of Asteroid development; at present there are discrepancies due to either different material, imperfect methods of research, or the personality of the observers.

The change of Holothurian spicules during growth, to which attention was directed in 1897 by MITSUKURI is the subject of highly interesting papers from LUDWIG (136, 137) and ÖSTERGREN (166). The importance to

the student of evolution and to the systematist of the study of post-larval growth changes is shown by DOEDERLEIN's remarkable memoir on *Gonio-discus sebæ* (50).

The eggs of the sea-urchin continue to serve as *corpora vilia* for the experimental embryologist, and DELAGE (43) in particular has obtained a result of the most profound significance. The experiments of VERNON (214) and DRIESCH (54) are also of great interest to the student of sex and heredity. The mere echinologist will be more interested in HERBST's investigation into the chemical composition of the water most favourable to the development of Echinoderms (96, 97, 98).

III. A. Among faunal studies, one of topical interest is LUDWIG's account of the Holothurians collected by the Hamburg expedition to Magellan Str. (137), discrediting the bipolar hypothesis, which however is supported by PRATT (178). LUDWIG's papers on the Holothurians and Ophiuroids of the Plate collection (138, 141) are of much significance, and should be compared with the New Zealand studies of FARQUHAR (61) and DENDY (46). LÖNNBERG's account of the fauna of Öresund (134) has more than local interest. PRUVOT (180) has been alluded to above. Other studies of Mediterranean Echinoderms are by PALLARY (168), LUDWIG (135), GOURRET (85) and KOEHLER (120). The last mentioned author also deals with Echinoderms dredged by 'l'Hirondelle' in various parts of the N. Atlantic (117), and by H.M.S. 'Investigator' in the Indian Ocean (118, 119). Here too see ANDERSON (7) and DOEDERLEIN (48, 49). In the Pacific area, besides the writings of LUDWIG above referred to, the chief work is by AGASSIZ (2) on the Echinoids collected by the 'Albatross.' YOSHIWARA (228) continues the study of Japanese Echinoids.

III. B. Under Geological Distribution and the study of extinct faunas, must be mentioned the work on the fossil Echinoids of Cuba by EGOZCUE Y CÍA (55). In Egypt the Tertiary rocks and their Echinoid contents are studied by FOURTAU (65-68) and MAYER-EYMAR (147), while both Cainozoic and Mesozoic Echinoids are described by GREGORY (89). HALL's correlation of the Tertiary beds of Victoria (93, 94) gives further precision to the horizons of fossil Echinoids from that country. The Jurassic rocks of eastern France are elucidated in the books by A. GIRARDOT (78) and L. A. GIRARDOT (79). In Asia Minor several Jurassic Echinoids from the Caucasus have been described by the lamented SPENDIAROFF (202), and an exceedingly interesting study of the Liassic fauna, especially Crinoids, is contained in the paper of POMPECKJ (176). Turning to America we find suggestive articles by WELLER on Carboniferous (218) and Silurian (220) faunas, with the description of a few Devonian species (219).

IV. The additions to our Systematic lists may be analysed thus:

Holothurioidea.....	9 n. gen.	32 n. spp.	0 n. varr.
Echinoidea	13 "	277 "	11 "
Asteroidea	0 "	18 "	0 "
Ophiuroidea	3 "	34 "	3 "
Crinoidea	0 "	23 "	2 "
Cystidea	4 "	0 "	0 "
Blastoidea.....	0 "	0 "	0 "
Incertæ sedis	1 "	1 "	0 "
Total	30	385	16

There are also 2 new sub-genera of Echinoids. Three of the additions to Cystid genera and 4 to Echinoid species are only new names in place of preoccupied names.

The new Holothurians are due chiefly to R. PERRIER (172) and ÖSTERGREN (165), a few to LUDWIG (137); but many of the names are those assigned to larvæ by MORTENSEN (157).

The exceptionally large number of Echinoid species is misleading, for the vast majority of them should have been entered in the Record for 1887 (see POMEL, 175). Really very little has been done on this group, beyond a preliminary report by AGASSIZ (2), the description of Cuban fossils by EGOZCUE (55), of Echinoids from the N. Atlantic by KOEHLER (117), of Egyptian fossils by MAYER-EYMAR (147, 148) and GREGORY (89), various fossils by OPPENHEIM (163 & 115), Caucasian fossils by SPENDIAROFF (202), and careful studies of Baltic Cretaceous Echinoids by HENNIG (95) and SCHLUETER (194).

The New Zealand Asteroids are studied by FARQUHAR (50). DOEDERLEIN's important paper has already been alluded to. Nearly all the new names are due to MORTENSEN (157).

The chief papers on Ophiuroids are those of KOEHLER (117, 118, 121), DOEDERLEIN (49) and LUDWIG (141). MORTENSEN (157) again is responsible for many names attached to *Plutei*.

Of the new species of Crinoids, many are founded on fossil centrodorsals of *Antedon* or columnals of some Pentacrinid (NICOLAS 161 and POMEL 175). POMPECKJ (176) has a careful study of some Liassic *Pentacrinini*, BATHER (16) assigns many new species to *Petalocrinus*, and WELLER (217, 219) introduces a few N. American forms. BATHER (13) shows that all recent and many fossil species assigned to *Pentacrinus* should really be called *Isocrinus*.

There is no work of importance on *Cystidea* proper, but BATHER (16A) begins a series of studies in *Edrioasteroidea*, a Class which in this Record is, for convenience, retained under Cystids.

In the Systematic Index all species are now placed in alphabetical order under genera, the new ones being distinguished by the addition of **n. g.** or **n. sp.** If only authors would indicate their new species in some such way, and especially would refrain from adding their own names as though the species had already been described by them, then the labours of their colleagues would be greatly facilitated. They might also give up the misleading habit of affixing **n. sp.** to a species already long published. Into one or other of these traps it is hard for a Recorder not to fall.

From this rapid and necessarily invidious Summary, it will be seen that the year 1898, though it has produced nothing very great or very startling in the literature upon Echinoderms, has none the less been fruitful in solid works, and its harvest is undoubtedly abundant.

Any further personal remarks by the Recorder are placed, as heretofore, in square brackets.

CORRIGENDA (in Record of Echinoderma in Vol. xxxiv).

The following additions and corrections should be made in the Record for 1896-97 :—

- p. 15. No. 108, after pp. 112-122 insert pl. vii.
No. 109, after pp. 123-136 insert pl. vii.
No. 110, after pp. 1000-1005 insert pl. li.
 - p. 32. No. 305, the pp. are stated by the *Concilium Bibliographicum* to be 82-89. The paper is still unseen by the Recorder.
 - p. 53. In III, B, ii, f, Eocene :—insert "Lutetian, road from Ecos to Dampmesnil (Eure), *Macropneustes minor* ; CANU (48)."
 - p. 115. before *Glyptocrinus carleyi* insert *G. basalis* ;
before *Glyptocrinus gracilis* insert *G. globularis* Nich. and Eth.
probably *Archaeocr.*
 - p. 119. *Melocrinus oblongus* is not n. sp., but was previously published by Wachsmuth and Springer.
-

I. TITLES.*

- 1.*ACKERMANN, K. Thierbastarde. Zusammenstellung der bisherigen Beobachtungen ueber Bastardirung im Thierreich nebst Litteraturnachweisen. I. Theil: Die wirbellosen Thiere; II. Theil: Die Wirbelthiere. 8vo, Kassel (Selbstverlag). [II, F, viii.]
Abstract by B. NÖLDEKE, Zool. Centralbl. vi, p. 113 (7 March, 1899).
2. AGASSIZ, A. Reports on the dredging operations off the west coast of Central America to the Galapagos, to the west coast of Mexico, and in the Gulf of California, in steamer "Albatross," &c. xxiii. Preliminary Report on the Echini. Bull. Mus. Harvard, xxxii, No. 5, pp. 71-86, pls. i-xiii, 1 map. (June.) [II, A, i & iv. IV, c.]
Abstracts: in J. R. Micr. Soc. 1898 (Oct.), p. 544; by H. LUDWIG, Zool. Centralbl. v, p. 561 (8 Sept. 1898). Note by J. LAMBERT, Rev. crit. Pal. iii, p. 123 (July, 1899).
- ALESSANDRI, G. DE. (1) Zool. Rec. 1897. Critical review by J. LAMBERT, Rev. crit. Pal. iii, pp. 116 & 117 (July, 1899).
3. AMI, H. M. Synopsis of the Geology of Montreal. Brit. Med. Assoc. Guide, pp. 45-49, Author's Edition, Montreal. (Dec. 1897.) [III, B, iv, h.]
4. AMMON, L. v. Das Gipfelgestein des Elbrus nebst Bemerkungen ueber einige andere kaukasische Vorkommnisse. Zeitschr. deutsch. geol. Ges. xlix, pp. 450-481. (Feb.) [III, B, iii, d.]
5. ANASTASIU, V. Le Trias de la Dobrogea. Bull. Soc. geol. France (3) xxv, pp. 890-893. Observations de E. HAUG, p. 894. (Feb.) [III, B, iii, e.]
6. —. Sur le Crétacé de la Dobrogea. Bull. Soc. geol. France (3) xxvi, pp. 192-194. (May.) [III, B, iii, b.]
7. ANDERSON, A. R. S. Report of the Surgeon Naturalist for the season ending 31st March, 1898. Rep. Marine Surv. India, 1897-1898, pp. 5-12. [III, A, iii.]
8. ANDREWS, E. A. Filose activity in metazoan eggs. Zool. Bull. ii, pp. 1-13. (July.) [II, F, iv.]
Abstract by R. P. B[IGELOW], Amer. Natural. xxxii, p. 878 (Nov.)
9. ANGELIS D'OSSAT, G. DE. Contribuzione allo studio paleontologico dell' alta valle dell' Aniene. Boll. Soc. geol. Ital. xvi, pp. 280-318. (Feb.) [III, B, ii, d; iii, b, 1. IV, c.]
Abstracts,—Boll. Com. geol. Ital. xxix, p. 286. Critical by P. E. VINASSA DE REGNY, Riv. ital. Pal. iv, pp. 2, 3 (June?).
- ARNAUD, H. (14) Zool. Rec. 1897. Abstract, Annuaire geol. xiii, pp. 296, 297 (April, 1897).—(15) Zool. Rec. 1897. Abstract, Annuaire geol. xiv, p. 323. (April, 1898.)
10. —. Observations sur le *Cidaris pseudopistillum* Cott. *Brissopneustes Aturensis*. Act. Soc. Bordeaux, liii, pp. 103-118, pl. ii. (July.) [IV, c.]
Review by J. LAMBERT, Rev. crit. Pal. iii, p. 35 (Jan. 1899).
11. BAIN, H. F. Geology of Decatur County. Rep. Geol. Surv. Iowa, viii, 255-309, pls. xxi-xxiv, and folding map. [III, B, iv, d.]
- BARTHELIS, P. (4) Zool. Rec. 1895. Abstract with reference to methods of research, by E. SCHOEDEL, Zeitschr. wiss. Mikr. xiv, p. 473 (4 May).

* An asterisk prefixed to a quotation indicates that the Recorder has not seen the Paper or Work referred to.

- BATHER, F. A. (24) Zool. Rec. 1897. Critical Abstract by O. JAEKEL, N. Jahrb. Min. 1898, i, p. 401 (April).—(27) Zool. Rec. 1897. Abstracts: in Boll. Com. geol. Ital. xxix, p. 146 (Oct.); by O. JAEKEL, N. Jahrb. Min. 1898, ii, p. 545 (Nov.).—(30) Zool. Rec. 1897. Critical Abstract by O. JAEKEL, N. Jahrb. Min. 1899, i, p. 179 (Dec.).—(31) Zool. Rec. 1897. Reply by J. W. GREGORY, Geol. Mag. (n. s.), dec. iv, vol. iv, p. 427 (Sept. 1897).
12. —. "Mesites." Ann. Mag. Nat. Hist. (7), i, pp. 102, 103. (Jan.)
[IV, G.]
Abstract by J. LAMBERT, Rev. crit. Pal. ii, p. 66 (April).
13. —. *Pentacrinus*: a name and its history. Nat. Sci. xii, pp. 245–256, 1 fig. (April.) Corrigenda, xiii, p. 72 (July). [II, E, iv. IV, F.]
Abstract by J. LAMBERT, Rev. crit. Pal. ii, p. 164 (Oct.).
14. —. Wachsmuth and Springer's classification of Crinoids. Nat. Sci. xii, pp. 337–345. (May.) [II, B, i, f, 1 & 5. IV, F.]
Abstract by J. LAMBERT, Rev. crit. Pal. ii, p. 163 (Oct.).
15. —. Wachsmuth and Springer's Monograph on Crinoids. [First four notices.] Geol. Mag. (n. s.), dec. iv, vol. v, pp. 276–283, 318–329, 419–428, 522–527. (June, July, Sept., Nov.)
[II, B, i, f, 1, 5 & 9: E, iv.]
A Review of WACHSMUTH, C. & SPRINGER, F. (336) Zool. Rec. 1897, with original matter.
16. —. *Petalocrinus*, Weller and Davidson. Quart. J. Geol. Soc. liv, pp. 401–441, 15 figg., pls. xxv & xxvi. (5 Aug.)
[II, A, i & iii: B, i, f, 5; ii, d, 2. III, B, iv, g. IV, F.]
Abstracts: Proc. Geol. Soc. No. 692, pp. 87 & 88 (April). Nature, lviii, pp. 46, 423 (12 May & 1 Sept.). Ann. Nat. Hist. (7), ii, pp. 195 & 196 (Aug.). By J. LAMBERT, Rev. crit. Pal. iii, pp. 37 & 38 (Jan. 1899).
- 16A.—. Studies in Edrioasteroidea. I. *Dinocystis Barroisi*, n. g. et sp., Psammites du Condroz. Geol. Mag. (n. s.) dec. iv, vol. v, pp. 543–548, pl. xxi. (Dec.) [II, B, i, g. III, B, iv, f. IV, G.]
17. BEECHER, C. E. The origin and significance of spines: a study in evolution. Amer. J. Sci. (4), vi, pp. 1–20, 125–136, 249–268, 329–359, pl. i. (July–Oct.) [II, A, i: B, i, a, 5; f, 5.]
Abstract in J. R. Micr. Soc. 1898 (Dec.), p. 619.
18. BELL, A. On the Pliocene Shell-beds at St. Erth. Tr. geol. Soc. Cornwall, xii, pp. 111–166, pls. i–iii. [III, B, ii, c. IV, C.]
19. BERTRAND, L. Étude géologique du Nord des Alpes-Maritimes. Bull. Carte geol. France, ix, No. 56, 214 pp., viii pls. [III, B, iii, c, 3.]
Abstract, Annuaire geol. xiv, pp. 218–229 (April).
- BIZET, P. (13) Zool. Rec. 1895. Abstract, Annuaire geol. xiii, pp. 66–68 (April, 1897).
20. BOEHM, G. Mitteilungen aus dem Aufnahmegebiete des Blattes Kandern. Mt. Badisch. Geol. Landesanst. iii, pp. 667–687.
[II, D, viii. III, B, iii, c, 2; d.]
21. BORDAS, L. Anatomie et fonctions physiologiques des organes arborescents ou poumons aquatiques de quelques Holothuries. C.R. Ac. Sci. cxxvii, pp. 568–570. (Oct.) [II, B, i, b, 6: c, ii, iii, v & vii. IV, B.]
Abstracts: Rev. Sci. (4), x, p. 598 (5 Nov.); J. R. Micr. Soc. 1899 (Feb.), p. 39; Nat. Sci. xiv, p. 64 (Jan. 1899).
- BOVERI, T. (42) Zool. Rec. 1897. Abstracts: by F. HENNEGUY & G. POIRAULT, Année biol. 1896, p. 9 (1898); by A. LABBÉ, *tom. cit.* pp. 58–60.

22. BOUIN, M. & P. Sur la présence de formations ergastoplasmiques dans l'ovocyte d'*Asterina gibbosa* (Forb.). Bibliog. Anat. vi, pp. 53-62, 6 figg. (31 May 8.) [II, F, iii.]
Abstracts: by H. LUDWIG, Zool. Centralbl. vi, p. 240 (4 April, 1899) and Zool. Jahresber. 1898 (July, 1899); by R. FICK, Zool. Centralbl. vi, p. 435 (20 June, 1899).
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II. BIOLOGY.

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- i. **General Principles**:—Evolution of spines in Echinoderms; BEECHER (17) pp. 20, 329.—Relation of specific characters to rapidity of evolution, exemplified in Crinoids; BATHER (16) p. 421.
- ii. **Relations of Echinoderma**:—Adoral ciliated band of Echinoderm larvæ homologous with endostyle and peripharyngeal band of lower Chordata; GARSTANG (75).—Relation of *Balanoglossus* to Echinoderms; DELAGE (44) pp. 329–331.
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(B.) MORPHOLOGY.

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2. Symmetries:—Vacant.
3. Homologies of Classes:—Vacant.
4. Skeletal tissue:—Vacant, but see under c. 4 and F. vi. c. 4.
5. Skeletal Anatomy:—Difference between spines in Echinoderma and in other organisms; BEECHER (17) p. 350.
- 6 & 7. Hydrocoel, Coelom and other body-cavities:—Coelom and hydrocoel, general relations and homologies; ZIEGLER (131) pp. 63–65, 71, 73.
8. Digestive System, Cuvierian organs:—Vacant.
9. Nervous Systems:—Nervous tissue; FOL (63) pp. 383, 391.
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11. Axial organ or Ovoid gland:—Vacant.
12. Genital System:—Vacant.

b. *HOLOTHURIOIDEA*.

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4. Skeletal tissue:—Giant spicules found in *Synapta digitata*; LUDWIG (135) p. 5.—Differences in spicules of litoral antarctic *Cucumariæ*; LUDWIG (137) p. 15.
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 7. Coelom and other Body-cavities:—Canal formed in mesentery of *Holothuria poli* near gonads, supposed homologous with aboral sinus of *Ech.*, or perihæmal space of dorso-ventral lacuna in *Ast.* and *Oph.*; RUSSO (188).
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- c. *ECHINOIDEA*.
- 1–4. Vacant.
 5. Skeleton:—Apical systems of *Galeropygus*, *Hyboclypeus* and *Echinobrissus*; LAMBERT (128).—Apical systems of *Echinocorys carinatus* (with new enlarged fig.) and of others, abstracted from Janet & Cuenot, Zool. Rec. 1891; JANET (106) pp. 7–11.—Pedicellaria of *Phormosoma uranus* (p. 13), *Sperosoma* (p. 19), *Temnechinus maculatus* (p. 22), *Echinocardium pennatifidum* (p. 26), *Palæotropus hirondellei* (p. 30); KOEHLER (117).
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 8. Digestive System:—Structure of gut, phagocytes, granular cells; SAINT-HILAIRE (191).—Intestinal siphon in *Phormosoma uranus* (p. 13), *P. placenta* (p. 21), *Sperosoma* (p. 21), course of gut in *Palæotropus hirondellei* (p. 30); KOEHLER (117).
 9. Vacant.
 10. Mesodermal Tissues (exc. skeletal):—Mesenteries in *Sperosoma* and *Phormosoma*, representing vertical muscles of *Asthenosoma*; KOEHLER (117) p. 20, pl. iv.
 - 11 & 12. Vacant.
- d. *ASTEROIDEA*.
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 2. Symmetries:—Planes of bilateral symmetry coincident in larva and adult *Asterias*; GOTO (81) p. 240: same in *Asterina gibbosa*; GOTO (82) p. 228.

3. Vacant.
4. Skeletal tissue:—"Krystallkörper" in plates, esp. of dorsal surface, being homogeneous, crystalline areas of stereom passing outwards from about the mid-level of the plate, observed in *Goniodiscus sebæ*, *G. articulatus*, *G. pleyadella*, and in spp. of *Stellaster*, *Anthenea*, *Pentaceros*, *Nidorellia*, *Pentaceropsis*, *Culcita*, *Asteropsis*, *Gymnasteria*, *Phaneraster*; DOEDERLEIN (50) p. 491.
5. Skeleton:—Septal pillars, their value in classification and association with "Krystallkörper" (p. 500); Reticularia, between primary plates, distinguished as outer and inner (p. 501); Distribution of alveolar pedicellaria, the homologies of their basal plates (p. 502); DOEDERLEIN (50).
6. Hydrocoel &c.:—Communication of stone-canal with axial sinus in *Asterias pallida*, *A. tenera*, *Solaster endeca*, *Asterina gibbosa*, *Cribrella sanguinolenta*, *Astropecten bispinosus*; GOTO (81) p. 271; in *Asterias*; GOTO (82) p. 239.
7. Coelom and other Body-cavities:—Their homologies in *Asterina gibbosa*; GOTO (80).
- 8-12. Vacant.

e. *OPHIUROIDEA*.

- 1-4. Vacant.
5. Skeleton:—"Glasplättchen," secondary formations in deeper layers of integument in *Ophiomyxa* (p. 770), law of arm-branching in *Gorgonocephalus* (p. 778), hooks on arms of same (p. 780); LUDWIG (141).
- 6-12. Vacant.

f. *CRINOIDEA*.

1. General:—Generalised description of a simple type of Crinoid, and of chief modifications; BATHER (14).—Terminology of Wachsmuth & Springer criticised; BATHER (15).
- 2-4. Vacant.
5. Skeleton:—Base, mono- or di-cyclic, relation to abactinal nervous system (p. 422), fusion of basals (p. 426); Radials, simple and compound, their distribution in Inadunata (pp. 419-422); Orals, homologies discussed (p. 523); BATHER (15).—Protective spines on ventral sacs of *Crin.* (p. 252), and on surface of *Crin.* and *Ast.* (pp. 256, 260); BEECHER (17).—Alleged occurrence of pores in ventral sac of *Fistulata*, esp. *Aulocrinus*, disputed; BATHER (15) p. 525.—Arms, rami, and ramuli; BATHER (15) p. 522.—The arm-fan of *Petalocrinus* (pp. 410-420), including law of arm-branching for *Cyathocrinoidea* (p. 411); BATHER (16).—Covering plates on genital pinnules of *Antedon bidens*; DOEDERLEIN (48) p. 476.—'Proximale,' new term proposed for persistent proximal columnal of *Flexibilia*; BATHER (14) p. 341.—Stem-characters discussed (p. 324), origin of cirri (p. 326), evolution of pores in stem (p. 326 and fig.), the dorso-central conception criticised (p. 328); BATHER (15).—Detailed account of "*Cyathocrinus*" *ramosus*, esp. of stem; SPANDEL (201) pp. 21-28, pl. xii.
- 6-8. Vacant.
9. Nervous System:—Relation of axial cords to mono- and di-cyclic base; BATHER (15) p. 422.
10. Mesodermal tissues, joints:—Distribution of syzygies in *Actinometra paucicirra*; DOEDERLEIN (48) p. 479.
- 11 & 12. Vacant.

g. *CYSTIDEA*.

5. Skeleton of *Dinocystis*, new type of Edrioasteroid; BATHER (16A).

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- a. In form :—Study of variation in *Iheringia patagonensis*, figures of modes *alatus*, *orbicularis*, *clypeatus*, *ovalis*; LAHILLE (126).
- b. In form and surface characters :—Of *Ophioglypha tessellata* including skeletal characters; KOEHLER (117) p. 39.—In shape of spicules of *Holothuria lubrica* (p. 434), in size of tentacles in *Phyllophorus mollis* (p. 437); LUDWIG (138).—Numerous minor variations in spp. of littoral *Oph.*; KOEHLER (118).—Distrib. of spines in *Ophiactis asperula* (p. 754), number of arm-spines in *Ophiomyxa vivipara* (p. 772); LUDWIG (141).—Local races of *Asterias calamaria*; FARQUHAR (60) p. 187.
- c. In colour :—In life and alcohol, of various antarctic Holothurians; LUDWIG (137).—Of *Cucumaria leonina*, *C. godeffroyi*, *Phyllophorus mollis*, *P. chilensis*, *Anapta fallax*, *Chiridota pisanii*; LUDWIG (138).—In life, of Jamaican *Ech.* and *Ast.*; CLARK (35).—Blue *Asterina folium*; CLARK (34) p. 408.—Local races of *Stichaster insignis*; FARQUHAR (60) p. 188.—Of *Ophiactis asperula*, *O. kroyeri*, *Amphiura chilensis*, *Ophionereis schayeri*, *Ophiomyxa vivipara*, *Gorgonocephalus chilensis*; LUDWIG (141).—In life, of Jamaica *Oph.*; GRAVE (87).—In spirit (?) of many spp. of littoral *Oph.*; KOEHLER (118).—*Amphiura elegans* reddish not greyish in life; GRIEG (91) p. 26.—Colour of spp. of *Antedon* and *Actinometra*; DOEDERLEIN (48).—Tendency to violet coloration in Bermuda Echinoderms; CLARK (34) p. 409.
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- b. Differences of Colour :—Vacant. (See under II, B, ii, c).
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- iii. **Respiration**:—Osmosis, respiratory trees, *Holothuria* and *Stichopus*; BORDAS (21).
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(D.) BIONOMICS.

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- ii. **Special habits**:—Vacant.
- iii. **Habitat**:—Of *Hol.*, *Ech.*, *Ast.* and *Oph.* in Öresund; LÖNNBERG (134) pp. 46–50.—Habitats of Echinoderms at Banyuls; PRUVOT (179).—Habitats of Echinoderms at Roscoff and in G. du Lion; PRUVOT (180) tables.—Effect of various degrees of impurity of water, plants, bacteria, sunlight, other animals, &c. on growth of Echinoid larvæ; VERNON (212 & 213).
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- iv. **Feeding**:—Food of *Synapta vivipara*; CLARK (32) p. 56.—Food of *Phyllophorus chilensis* distinct from that of *P. mollis*; LUDWIG (138) p. 441.
- v. **Defence and Protection**:—
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- vi. **Locomotion**:—Vacant.
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- viii. **Parasites and Commensals**:—Parasitic gastropod, ? *Entocolax*, in *Chiridota pisanii*; LUDWIG (138) p. 446.—Small brown calcareous sponge firmly attached to skin of *Synapta vivipara* just behind the circle of tentacles; CLARK (32) p. 56.—*Stichopus* sp. living in cavities of madreporæ-reef shelters the fish *Euchelyophis vermicularis*; COUTIÈRE (38) p. 240.—*Hippolytina*, a small Crustacean, sheltered by *Culcita*; a small fish, probably *Engraulis*, shelters among spines of *Diadema setosum* and feeds on *Posidonia*; COUTIÈRE (38) p. 238.—Mollusc *Montacuta substriata* among spines of ventral side in *Spatangus purpureus*; GRIEG (91) p. 27.—Parasitic Copepod, *Pionodesmotes*, bores into ventral surface of test in adult *Phormosoma uranus*, which forms internal galls; KOEHLER (117) pp. 14 & 61, pl. x.—Ostracod, *Cypridina globosa*, very frequently found on *Toxopneustes droebachiensis*, on a spine near anus; LÖNNBERG (134) p. 37.—*Millericrinus horridus* bored by *Myzostoma*; BOEHM (20) p. 675.—Parasites (? *Myzostoma*) common on *Apiocrinide* of Ober Weiss-Jura, rare on *Encrini* of Muschelkalk, absent from *Pentacrini* of Lias; FRAAS (70).
- ix. **Echinoderms as Food**:—*Hipponoe* eaten by natives of Jamaica; CLARK (33) p. 164.
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- x. **Echinoderms as Rock-formers**:—Jurassic, chiefly *Crin.* also *Ech.* and *Ast.*; GIRARDOT (79) pp. 163, 190, 192, 205, 253, 283, 292.—Rôle of Crinoidea in Silurian reef-building as seen in Gotland; WIMAN (225), pp. 319, 322, 323.—Echinoderms as constituents of Chalk; CAYEUX (30) pp. 218, 222, 227, 235, 239, 244, 248, 253, 256, 261, 266, 268, 271, 274, 276, 278, 280, 290, 294, 296, 298, 299, 301, 304, 309, 310, 312, 315, 317, 329, 339, 342, 360, 372, 374, 393, 409, 411, 413, 445.—Neritic Sand forming on floor of Irish Sea, largely Echinoid spines; HERDMAN (99) p. 215 and tables.

(E.) MISCELLANEOUS.

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- a. **Preservation** :—Of colours of Echinoderms in formalin ; WOLFENDEN (227) p. 2.—Of larvæ of *Asterias pallida* ; GOTO (81) p. 239.—Killing and preservation of young *Synapta vivipara* ; CLARK (32) p. 53.
 - b. **Methods of research** :—Application of X-rays to study of Echinoderms ; WOLFENDEN (227).
 - c. **Museum Exhibits and Collections** :—Fossils in Musée Géologique de l'Université, St Pétersbourg, with names of historical collections, and figures of *Asteroblastus stellatus*, *Mesites pusireffskii*, *Protocrinus primordialis*, and *Hemicosmites malum* ; ST PETERSBURG, IMP. UNIV. (192) pp. 37, 39, 41, 43, 47.—List of historical specimens of Ordovician *Ast.*, *Crin.*, *Cyst.* in Amer. Mus. Nat. Hist. ; WHITFIELD & HOVEY (224) pp. 24–27.
 - d. **Instruction** :—Practical guide to dissection of *Asterias rubens*, *Echinus esculentus*, and *Holothuria tubulosa*, with original figures of *A. rubens* dissected from dorsal surface, madreporite, oral nerve-system, and sections of ray of same, dorsal surface, peristome, and jaws of *E. esculentus* ; KÜKENTHAL (123) pp. 108–128. Text-books ; LAHUSEN (127), PARKER (169), ROULE (185).
- ii. **Economics** :—*Asterias rubens* used for manure ; GADEAU DE KERVILLE (74) p. 335.—Crinoid columnals, star-stones, at Étoile, used as ornaments, toys, and trademark ; GIRARDOT (79) p. 163. Bajocian star-stones mounted as ornaments at Digne ; NICOLAS (161) p. 138.
- iii. **Bibliography** :—Of Antarctic *Hol.* ; LUDWIG (137) p. 94.—Of Echinoderm larvæ ; MORTENSEN (156) p. 160, and (157).—Literature of Echinoderma for 1897, with abstracts ; LUDWIG (139).—Index to names of American fossil Echinoderms, chiefly *Crin.*, and mostly published between 1889 and 1892, with (on p. 683) discussion of validity of J. Hall “Descr. of n. spp. of Crinoidea, from investigations of the Iowa Geol. Surv., Prelim. notice” 1861 ; MILLER (153) pp. 672–683.—Similar Index to names mostly published between 1892 and 1897, with remarks on date of Miller (187) Zool. Rec. 1893, and Wachsmuth & Springer (50) Zool. Rec. 1892 ; MILLER (154) pp. 719, 730–755.
- iv. **Historical, Popular notions, &c.** :—Account of literature of Crinoids by Wachsmuth & Springer [(336) Zool. Rec. 1897,] criticised ; BATHER (15) p. 280.—Early history of *Pentacrinos*, *Encrinos*, *Asteria* ; BATHER (13).
- Fishermen's names for *Arbacia pustulosa* “oursin juif,” and *Echinocardium cordatum* “oursin blanc des sables,” in Algeria ; PALLARY (168).—*Ophiothrix fragilis* called “le Traplus” by fishermen of Calvados ; GADEAU DE KERVILLE (74) p. 337.—*Asterias rubens* called “la Fifotte” by fishermen of Calvados ; GADEAU DE KERVILLE (74) p. 334.—“Corrupio,” local Brazilian name of *Toxopneustes variegatus*, and “pindá” local name of *Encope emarginata* ; IHERING (102) p. 155.—*Clypeaster ægyptiacus* called “Chell,” plural “chelloul” by Bedouins ; FOURTAU (68) p. 40.

(F.) AUXOLOGY.

- i. **General Principles** :—Vacant.
- ii. **General Accounts** :—Vacant.
- iii. **Formation of Gonads** :—Sexes distinct in *Ophiomyxa vivipara*, ovum described ; LUDWIG (141) p. 773.—♂ *Cucumaria crocea* ;

LUDWIG (137) p. 19.—*Pseudopsolus macquariensis* is ♂; LUDWIG (137) p. 51.—Spermatogenesis and oogenesis in *Asterina gibbosa* (p. 279), with protandry in races at Roscoff and Banyuls, but sexual polymorphism at Naples, also ♂ *Asterias glacialis* (p. 273 footnote); CUÉNOT (41).—Filaments in maturing ovum of *Asterina gibbosa*; BOUIN (22).—Unripe ova of *Hol.* and *Ech.*, described, their response to spermatozoa; IWANZOFF (104).—Maturation of ovum and passage into body-cavity in *Synapta vivipara*; CLARK (32) p. 58.

- iv. **Oviposition, Fertilisation, and Segmentation:**—Breeding of *Echinarachnius parma* and *Ast.* Woods Holl, March 1898; BUMPUS (23).—Various Echinoderms breeding in April at Woods Holl; MEAD (149).—Breeding of *Ech.*, *Ast.*, *Oph.*, *Hol.* at Woods Holl, summer 1898, see *Echinarachnius*, *Arbacia*, *Ophiopholis*, *Ophiura*, *Thyone*, and *Synapta*; BUMPUS (24) p. 855.—Breeding period of *Cucumaria crocea*; LUDWIG (137) p. 24.—Breeding season of *Phyllophorus urna*, young in body-cavity; LUDWIG (136).—Breeding period and mode of birth of *Synapta vivipara* (p. 57), fertilisation and segmentation (p. 58); CLARK (32).—Breeding period of *Solaster endeca*, colour of eggs; GRIEG (91) p. 25.—Breeding period of *Luidia savignyi*; M'INTOSH (143) p. 108.—Breeding period of *Toxopneustes variegatus*, *Hipponee esculenta*, and *Echinoneus semilunaris*, at Jamaica; CLARK (35).—Breeding period of *Ophiocoma echinata*, *O. risei*, and *Ophiura appressa*, at Jamaica; GRAVE (87).—*Ophiactis kroyeri* carries its young, ?viviparous; LUDWIG (141) p. 759.

Segmentation of *Ech.* ovum; FOL (63) pp. 261–269, 283, 292, 296.—Fertilisation and segmentation of ovum in *Sphaerechinus* and *Asterias*; ERLANGER (59).—Autofecundation in *Asterina gibbosa* (p. 278), in *Asterias glacialis* (p. 274 footnote); CUÉNOT (41).—Pseudopodia connecting cells in blastula of “Starfish common at Roscoff” and segmenting ovum of “the common echinus of Roscoff”; ANDREWS (8) pp. 6–9 and figg. 1–3.

v. **Larval Stages:**—

- a. Rarity of Echinoderm larvæ in Kingston Harbour, Jamaica, summer of 1896; CLARK (33) p. 165.—Discussion of all known Echinoderm larvæ, exc. *Crin.*, terminology with tables of terms, homologies of parts with comparative text-figg., orientation, determination of spp., systematic description, occurrence and distribution, bibliography; MORTENSEN (156 & 157).
- b. The Pentactula of *Synapta vivipara*; CLARK (32) p. 63.—Development of *Synapta vivipara*; GEROULD (77).—Later larval stages of *Phyllophorus urna*; LUDWIG (136).—Description of young *Psolus antarcticus*; LUDWIG (137) p. 56.—Young *Cucumaria crocea*, development (p. 20): young *Cucumaria parva* described and figd. (p. 26, pl. i): young of *Cucumaria lævigata* (p. 35): young of *Chiridota contorta* (p. 80); LUDWIG (137).
- c. Vacant.
- d. Development of larva and metamorphosis in *Asterias pallida*; GOTO (81).—Goto's discrepancies from MacBride ascribed to imperfect methods of preparation; MACBRIDE (142).—Origin of body-cavities in larva of *Asterina gibbosa* and their relations in the adult; GOTO (80).—Preoral lobe, mucous glands (p. 230), origin of coelomic cavities and differences from MacBride's account, *Asterina gibbosa*; GOTO (82).—*Bipinnaria* with young *Luidia* descr. and figd.; M'INTOSH (143).
- e. From ovum to pluteus in *Ophiocoma echinata*; GRAVE (86).
- f, g, h. Vacant.

vi. **Organogeny** :—a. *Echinoderma* :—

4. Stereom formation, "Kalksalze in einer spärlichen organischen Interzellularsubstanz abgelagert"; FOL (63) pp. 338, 347.

b. *Holothurioides* :—

1. Derivation of organs of *Synapta vivipara* from germ-layers of gastrula; CLARK (32) p. 74.
4. Origin of calcareous structures in *Synapta vivipara*; CLARK (32) pp. 67, 69, 72.—Stages in development of spicules in *Phyllophorus urna*; LUDWIG (136) p. 98.
6. Origin of hydrocœl, tentacles, and radial water canals in *Synapta vivipara*; CLARK (32) pp. 62, 68.—Stone-canal and pore-canal in larva of *Phyllophorus urna*; LUDWIG (136) p. 98.
7. Origin of circumœsophageal sinus (p. 64), of blood-vascular system (p. 71), in *Synapta vivipara*; CLARK (32).
8. Origin of digestive tract in *Synapta vivipara*; CLARK (32) pp. 65, 70.
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12. Origin of generative systems in *Synapta vivipara*; CLARK (32) pp. 71, 72.

c. *Echinoidea* :—Vacant.d. *Asteroidea* :—

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7. Origin of cœlomic cavities of adult *Asterias* (p. 252): Perihæmal and peribranchial cavities in *Asterias pallida* are schizocœlic from mesenchyme (p. 274); GOTO (81).—Origin of cœlomic cavities of adult *Asterina* (p. 231): Origin of perihæmal system in *Asterina*, partly enterocœlic (p. 235); GOTO (82).
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10. "Mesodermic muscle fibres" "secreted on the surface turned away from the cavity" of hydrocœl and enterocœl in *Asterias pallida*; GOTO (81) p. 272.

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vii. **Post-larval Growth-stages** :—

- b. *Holothurioides* :—Spicules of *Phyllophorus urna* pass from an Elpidiine stage in larva, to the form typical of genus, and then give place in old age to secondary rosettes; this different in *P. granulatus*; LUDWIG (136) p. 98.—Change in spicules of *Cucumaria lœvigata* with advancing age; LUDWIG (137) p. 33.—*Holothuria aphanes* believed to represent young of *H. impatiens*, the chief difference being in the spicules which disappear in the larger *H. aphanes*, and are after an interval replaced by others of *H. impatiens* type; ØSTERGREN (166).
- c. *Echinoidea* :—Neanic *Phormosoma uranus*, 5–25 mm. diam., development of peristome and periproct; KOEHLER (117) p. 13.
- d. *Asteroidea* :—Growth stages in *Goniiodiscus sebæ* discussed in detail, showing gradual change from neanic stage, *Hosea spinulosa*,

to gerontic *Culcita* stage, which is the phyletic successor; in other words *Pentagonasterinae*, *Goniodiscinae*, and *Pentacerotidae*, are phylo-
neanic, phylephebic, phylogerontic; DOEDERLEIN (50) p. 494.—
Brepheic *Asterina exigua*; PARKER & HASWELL (169) p. 361, fig. 291.
—Addition of arms in *Asterias calamaria*, a giant specimen;
FARQUHAR (60) p. 188.

- e. *Ophiuroidea*:—Brepheic stages of *Ophiomyxa vivipara* measured and described; LUDWIG (141) p. 773. See also under vi. e. 5 for growth changes in *Ophionereis* and *Gorgonocephalus*.
- f. *Crinoidea*:—Neanic *Actinometra belli*, brachia; DOEDERLEIN (48) p. 479.

viii. **Developmental mechanics and Experimental Embryology**:—Summary of recent work in experimental cytology, with references to Echinoderms on pp. 11, 21, 63, 67, 68, 70, 77, 78, 84, 90, 97, 98, 100, 121, 128, 132, 138, 139, 144; LABBÉ (124).

Theoretical organisation of the Echinoderm ovum, as compared with others, with new experiments on partial segmentation after fragmentation of ovum; DRIESCH (52).—When do the elementary morphogenetic processes come to an end in ontogeny?, e.g. when can segmentation be said to cease? Attempt to answer by counting the number of cells in entire and fragmented larvæ, e.g. mesenchyme cells in *Sphærechinus* larvæ, archenteron cells in *Asterias glacialis*; DRIESCH (53).—Is end of segmentation determined by number or by size of cells? Attempt to answer by counting cells in blastulæ and demi-blastulæ of *Sphærechinus*; MORGAN (155).—Ovum of *Strongylocentrotus lividus* divided by hand into portion with nucleus and centrosome and portion with cytoplasm alone; the latter was fertilised and formed gastrula with nucleated cells; DELAGE (43).—Spermovum of *Echinus* artificially divided into portion with sperm-nucleus and portion with ovo-nucleus, and subsequent segmentation of the former; ZIEGLER (230) part I.

Hybrid-larvæ:—Of *Strongylocentrotus lividus*, *Sphærechinus granularis*, *Echinus microtuberculatus*, *E. acutus*, *Echinocardium cordatum*, *E. mediterraneum*, *Arbacia*, *Dorocidaris*, prepotency of ♂ or ♀ varies as relative maturity of gonads; also slight infertility between colour vars. of same sp.; VERNON (214).—Of *Ech.* follow the characters of the ♀ in earliest stages, proved by experiments with *Echinus microtuberculatus*, *Sphærechinus granularis*, *Strongylocentrotus lividus*, and *Arbacia pustulosa*; DRIESCH (54).—Bastardisation; ACKERMANN (1).

Irregularity of mitosis and segmentation in ovum of *Echinus microtuberculatus*, with criticism of Boveri (42) Zool. Rec. 1897; ZIEGLER (230) part II.

Effect of different conditions of sea-water on growth of larvæ of *Strongylocentrotus lividus*; VERNON (212).—Effect of vegetable life, of fouling by animal life, including Holothurians and other Echinoids, on growth of larvæ of *Strongylocentrotus*, *Sphærechinus*, and *Echinus*; VERNON (213).—Development of eggs of *Arbacia* hastened by alkali (NaHO, 6/1000%), checked by acid (HCl); LOEB (132).—Effect on developing larvæ of *Echinus microtuberculatus* and *Asterias glacialis*, of lithium bromide, potassium sulphocyanide, and sodium butyrate, with general résumé of previous results; HERBST (96).—Phosphorus, sulphur, chlorine, sodium, potassium, magnesium, calcium carbonate, and iron, necessary for complete development of *Ech.* and *Ast.* larva; HERBST (97).—Phosphorus and iron not necessary for development of *Ech.* larva; HERBST (98).

III. DISTRIBUTION.

A. GEOGRAPHICAL.

- i. **General**:—Distrib. of Echinoderm larvæ, and relation to distrib. of Echinoderms in general; MORTENSEN (156) p. 153, and (157) p. 108.—Distrib. of brepheic *Ech.*, *Ast.*, *Oph.*, *Hol.*, by floating in currents, and supposed similar transference of Miocene Mediterranean forms across the Atlantic, also migration along bottom; AGASSIZ (2) pp. 71–73.—Varying capability for distribution, *Ech.*, *Ast.*, *Oph.*, *Hol.*; FARQUHAR (61) p. 303.

Comparison of Antarctic and Arctic *Holothuriidæ* (p. 9) *Elpidiidae* (p. 11) *Cucumariidæ* (pp. 13, 57) *Molpadiidæ* (p. 66) *Synaptidæ* (p. 88) and *Hol.* in general (p. 90), no support to Bipolar hypothesis; LUDWIG (137).

- ii. **Atlantic Ocean and adjacent Seas**:—Various localities, *Hol.* dredged by 'Travailleur' and 'Talisman'; PERRIER (172).

Scandinavia:—Norway. Vaagsfjord and Ulvesund, outer Nordfjord, list of *Hol.*, *Ech.*, *Ast.*, *Oph.*, *Crin.*, with habitats of some spp. mentioned; GRIEG (91) p. 24.—W. Norway, probably Molde, *Pseudocucumis*; ÖSTERGREN (165) p. 135.—Öresund, spp. of *Hol.*, *Ech.*, *Ast.*, *Oph.*, notably *Asterias hispidus* and *Ophioglypha sarsi*, general northerly character of Echinoderm fauna, habitats and depths noted (pp. 46–50), also genera classified according to nature of bottom (pp. 58–62), origin of the fauna and comparison with Greenland and Norwegian fjords (pp. 65–72); LÖNNBERG (134).

British Coasts:—Orkneys, *Asterias murrayi* 25 fms., *Echinocardium pennatifidum* 35 fms., also *Astropecten*, *Solaster*, *Luidia*, *Palmipes*, *Porania*, *Henricia*, *Spatangus*, *Echinus*, *Ophiocoma* and *Ophiura*; WOLFENDEN (227).—Moray Firth, Firth of Clyde, Loch Fyne, organisms captured, with stations and dates; FULTON (73); the same with addition of Firth of Forth and St Andrews B.; FULTON (72).—Loch Fyne, list of Echinoderms with depths, spp. of *Antedon*, *Porania*, *Stichaster*, *Solaster*, *Henricia*, *Asterias*, *Ophiura*, *Amphiura*, *Ophiopholis*, *Ophiocoma*, *Ophiothrix fragilis*, *Echinus*, *Spatangus*, *Echinocardium*, *Brissopsis*, *Synapta*, *Cucumaria*, *Thyone*, *Psolus*, and ? *Cribella* and *Ophiactis*; SCOTT (195).—St Andrews Bay, 5–6 fms., 30 Sept. 1896, *Bipinnaria asterigera*; occurrence of *Luidia ciliaris*, *L. sarsi*, and *L. savignyi* noted; M'INTOSH (143).—Falmouth, *Antedon rosacea* supplanted by *Ophiocoma nigra*; VALLENTIN (210).

French Coasts:—Normandy, Echinoderm fauna; GADEAU DE KERVILLE (74).—*Echinoderma* of Roscoff and of G. du Lion comparative lists; PRUVOT (180) tables.—B. of Biscay, spp. of *Echinus*, *Psammechinus*, *Echinocardium*, *Echinocyamus*, *Ophioglypha*, *Ophiocten*, *Ophiactis*, *Amphiura*, *Ophiacantha*, *Ophiothrix*, dredged by l'Hirondelle, with depths and nature of bottom; KOEHLER (117).

Mediterranean:—G. du Lion, Banyuls. Lists and habitat of Echinoderms; PRUVOT (179 & 180).—Cette, list and distribution of of Echinoderms in l'étang des eaux-blanches, partly brackish; GOURRET (85) p. 21.—*Asterias rubens* acclimatised at Cette, *Echinocardium pennatifidum* found with *E. cordatum* at Tamaris-sur-Mer (Var); KOEHLER (120).—G. of Naples, *Synapta inhærens*, *S. macranthya* n. s., *S. digitata*, and *S. thomsoni*, with comparative distrib. of those spp.; LUDWIG (135).—Coast of Algiers, G. of Oran, list of *Ech.*, 10 spp. of *Dorocidaris*, *Arbacia*, *Arbacina*, *Echinus*, *Sphærechinus*, *Strongylocentrotus*, *Echinocyamus*, *Echinocardium*, *Brissus*; PALLARY (168): *Arbacina pallaryi* n. s.; GAUTHIER (76) p. 840.—

Dardanelles and Bosphorus, list and distribution of Echinoderms ; MARION (146) pp. 166 & 172.

Azores :—spp. of *Antedon*, *Dorocidaris*, *Cidaris*, *Arbacia*, *Salenia*, *Asthenosoma*, *Phormosoma*, *Sperosoma*, *Temnechinus*, *Trigonocidaris*, *Echinus*, *Sphærechinus*, *Strongylocentrotus*, *Echinocyamus*, *Brissopsis*, *Palæotropus*, *Ophioglypha*, *Ophiomusium*, *Ophiocten*, *Ophiactis*, *Amphiura*, *Ophiacantha*, *Ophioconis*, *Ophiothrix*, dredged by l'Hirondelle, with depths and nature of bottom ; KOEHLER (117).

American Coast :—Newfoundland, spp. of *Strongylocentrotus*, *Echinarachnius*, *Ophioglypha*, *Ophiomusium*, *Ophiocten*, *Ophiopholis*, *Amphiura*, *Ophiacantha*, *Gorgonocephalus*, dredged by l'Hirondelle, with depths and nature of bottom ; KOEHLER (117).—Coldspring Harbor, Long Id., *Asterias forbesi*, *Arbacia punctulata*, *Synapta girardi*, *S. roseola* ; DAVENPORT (42) p. 686.—Jamaica, general account of marine fauna with habitats of Echinoderma ; CLARK (33).—List of *Ech.* and *Ast.* with habitat, and other notes ; CLARK (35).—List of *Oph.* with habitat and other notes ; GRAVE (87).—Bermuda, list of littoral Echinoderms ; CLARK (34).

S. Atlantic :—Ilha de S. Sebastião, *Ech.*, *Ast.*, *Crin.* ; IHERING (102) p. 155.

iii. **Indian Ocean and adjacent Seas** :—Littoral *Oph.* collected by 'Investigator,' with comparative distrib. for each sp., and (on p. 116) a complete list of spp. from Indo-Pacific region, note n. spp. and n. varr. of *Ophiolepis*, *Amphiura*, *Ophiopsila*, *Ophiocoma*, *Ophiacantha*, *Ophiomaza*, *Ophiothela*, *Ophiothrix*, *Ophiomyxa*, and *Sthenocephalus* n. g. ; KOEHLER (118).

Red Sea :—Djibouti, echinoderm fauna of madreporic reefs ; COUTIÈRE (37) pp. 88, 155.

Trawls of 'Investigator' between Bombay and Ceylon, *Hol.*, *Oph.* (one haul of "several thousands of specimens of some twelve different species"), *Persephonaster rhodopeplus*, *Zoroaster*, also *Phormosoma tenue*, *Ceolopleurus maillardi*, *Hemipodina mirabilis*, and *Platybrissus ræmeri*, new to the Indian fauna ; ANDERSON (7).—Ceylon, 34 fms., *Ophiothrix innocens* n. s. ; KOEHLER (121).—Andaman Is., Coromandel, Ceylon, and Laccadives, *Sphærothuria bitentaculata* ; KOEHLER (119).

Amboina and Thursday Id., spp. of *Antedon* and *Actinometra* ; DOEDERLEIN (48) : spp. of *Ophiactis*, *Ophiothela*, *Ophiophthirius*, *Astroschema* ; DOEDERLEIN (49).

iv. **Pacific Ocean and adjacent Seas** :—G. of Panama and G. of California, n. spp. of *Dorocidaris*, *Porocidaris*, *Salenia*, *Dialithocidaris*, n. g., *Dermatodiadema*, n. g., *Phormosoma*, *Pourtalesia*, *Plexechinus*, n. g., *Echinocrepis*, *Urechinus*, *Cystechinus*, *Phrissocystis*, n. g. [this is *not* a recent Cystid], *Homolampas*, *Aerope*, *Schizaster*, *Periaster*, *Brissopsis*, *Toxobrissus* ; AGASSIZ (2).

Lists of *Hol.* from Chile and Peru compared with those from Magellan, and Juan Fernandez, the last including *Holothuria platei* and *Chiridota fernandensis*, n. spp. ; LUDWIG (138).—Chile and Juan Fernandez, spp. of *Ophioglypha*, *Ophiactis*, *Amphiura*, *Ophionereis*, *Ophiomyxa*, and *Gorgonocephalus*, relation of Juan Fernandez and New Zealand faunas ; LUDWIG (141).

New Zealand, general discussion of Echinoderm fauna, and list with locc. and synn., definition of the N. Z. area ; FARQUHAR (61) : *Asterias*, *Stichaster*, and *Cribrella* with *C. lukinsi*, n. sp. ; FARQUHAR (60).—New Brighton beach, near Christchurch, *Caudina*, *Colochirus*, *Echinocardium*, thrown up by storm ; DENDY (46) p. 323.

Philippines :—List of Echinoderms ; CASTO DE ELERA (28).

Japan :—n. spp. of *Cidaris*, *Mespilia*, *Salmacopsis*, *Echinostrephus*, *Echinus*, *Fibularia*, and *Echinarachnius*; YOSHIWARA (228).

v. **Arctic Ocean and adjacent Seas** :—White Sea, *Asterias stellionura* in great numbers; KNIPOWITSCH (116) p. 318.

vi. **Antarctic Ocean and adjacent Seas** :—Antarctic in wide sense, to 40° S., discussion of *Hol.*, by species, by families, and in general; LUDWIG (137).—Falkland Is., List of Echinoderms collected at Hill Cove, West Id., Sept. and Oct., 1896, with comparative distribution, new occurrences are *Ophiothrix magnifica* and *Ophiomyxa vivipara*; PRATT (178) pp. 17–19.

B. GEOLOGICAL.

(i) GENERAL.

Echinoderma [sc. *Echinoidea*] not of much value in synchronising deposits; JUKES-BROWNE (107).—"Mieux que n'importe quel fossile, les échinides permettent de déterminer les âges de couches"; LAHILLE (126) p. 448.—General distribution of fossil *Hol.* Lower Carboniferous to Upper Jurassic; SPANDEL (201) pp. 40–43.

(ii) CAINOZOIC.

a. **General** :—Tertiary of Algeria, *Ech.*, *Ast.*, *Oph.*, *Crin.*; POMEL (175).—Australia, older Tertiary, corrections in list of *Ech.*; TATE (205), pp. 411 & 412.

b. **Pleistocene** :—Saharian, Cairo, comparative list of *Ech.*; MAYER-EYMAR (148) p. 64.—Suez Canal, *Laganum depressum*; GREGORY (89) p. 153.—Plain of Tor near Sinai, *Laganum sinaiticum*, *Clypeaster placunarius*; FOURTAU (69) p. 18.—Cuba, spp. of *Clypeaster*, *Echinoneus*, *Hemiaster*, and *Brissus*; EGOZCUE (55).

c. **Pleiocene** :—St. Erth, Cornwall, Echinoderms including *Echinus etheridgei*, n. sp.; BELL (18) p. 165.—Great Pyramid, *Clypeaster aegyptiacus*, correct horizon; FOURTAU (68).—Middle California, *vide sub* Miocene.

c & d. **Pleiocene and Meiocene** of Piedmont and Liguria, spines of *Diadema desori*; FORNASINI (64), and SACCO (190) p. 73.

d. **Meiocene** :—near Avignon,—uncritical lists of *Ech.*, preliminary descriptions of n. spp. of *Antedon* and *Pentacr. berthei*, n. sp.; NICOLAS (161), pp. 104, 107, 108, 114, 129–138: revision of *Antedon* and *Pentacrinus* [i.e. *Isocrinus*]; NICOLAS (162). See also PELLAT (170).—"Tegel" of Theben-Neudorf, Hungary, list of *Ech.*; SCHAFFER (193) p. 535.—Valley of Aniene, Italy, list of *Ech.*, with *Echinolampas mazzettii*, n. sp.; ANGELIS d'OSSAT (9) p. 291.—Cuba, spp. of *Laganum*, *Clypeaster*, *Encope*, *Echinolampas*, *Brissopsis*, *Schizaster*, and *Macropneustes*; EGOZCUE (55).—Middle California, distribution of *Ech.* in Quaternary, Merced, San Pablo, and Contra Costa co. series; MERRIAM (151).—Beaumaris near Melbourne, *Lovenia forbesi*, *Ortholophus lineatus*, *Clypeaster gippslandicus*, *Monostychia australis*, *Pericosmus* sp.; HALL (94) pp. 191, 195.

Middle Miocene :—Schwaben, *Scutella paulensis*; RÜHL (187) p. 379.

—Biklista-Kutsh, N. Greece, *Clypeaster*; PENECKE (171) p. 64.

Helvetian, Egypt, *Psammechinus*, *Echinolampas*, *Pericosmus*; GREGORY (89).

d & e. *Helvetian* and *Bartonian* of Piedmont, *Pentaceros*; SACCO (190) p. 72.

e. **Oligocene** :—*Upper* :—Doberg bei Bünde, Germany, *Echinolampas eberti*, n. sp. ; OPPENHEIM (168).—N. Greece, *Cidaris* and a Spatangid ; PENECKE (171) p. 51.

f. **Eocene** :—*Gualteria orbigny* at Blaye ; ENGERRAND (57).—Horizons of *Sismondia* and localities of Echinologists in Egypt ; FOURTAU (67).—Cuba, spp. of *Echinopodina*, *Echinanthus*, *Echinolampas*, *Asterostoma*, *Macropneustes*, and (?) *Hemiaster* and *Breynia* ; EGOZCUE (55).—Virginia, middle Atlantic slope, diadematoïd and spatangoid remains ; CLARKE (36).—Croydon bore, S. Australia, *Fibularia gregata*, *Scutella marsupinata* [nom. nud.] *Echinolampas murrayanus*, spp. of *Pentacr.* and *Antedon* (p. 196), Ki-ki bore, S. A., spp. of *Cidaris* and *Pentacr.* (p. 199) ; TATE (206).—Royal Park near Melbourne ; *Psammechinus woodsi*, ? *Toxobrissus* sp. ; HALL (94) p. 207. Lower Maude beds, Victoria, comparative list of *Ech.* various localities (p. 157), with corrections of list from Wauru Ponds (p. 159), Botesford Limestone (p. 160), limestone of Spring Creek (p. 162) ; HALL (93). ? Upper Eocene, *Iheringia* ; LAHILLE (126) p. 446.

Nummulitic—between Sallèles and Villegly (Aude) *Spatangus obesus*, *Schizaster rousseti*, *Pygorhynchus gauthieri*, *Cyphosoma* ; SICARD (196) p. 17.—Bague de Bordeillat at La Manère, E. Pyrenees, *Cidaris pseudo-serrata* ; ROUSSEL (186) p. 293.—Erratics, Schwaben, *Pentacr.*, *Conoclypeus*, *Cidaris* ; RÜHL (187) p. 334.—Roumania, *Conoclypeus conicus* and *Rhizocrinus piriformis* ; POPOVICI-HATZEG (177) p. 134.—Egypt, n. spp. of *Sismondia*, *Conoclypeus*, *Pygorhynchus*, *Semicyclipeus*, *Echinolampas*, *Nucleolites*, *Hemiaster*, *Brissopsis*, *Linthia*, *Schizaster*, *Macropneustes*, and esp. of *Pygurus*, *Caratomus*, and *Epiaster* previously unknown in Tertiary ; MAYER-EYMAR (147).

Bartonian, Mokattam, and Libyan series, Egypt, *Rhabdocidaris*, *Conoclypeus*, *Rhynchopygus*, *Echinolampas*, *Eupatagus*, *Hypsopatagus*, *Hemiaster*, *Linthia*, *Schizaster* ; GREGORY (89).—“Étage Lybien, sous-étage Sparnacien, couches à *Callianassa nilotica*, du Gebel Drounka, à Assiout, Égypte” contains *Anizaster gibberulus*, *Echinolampas crameri*, *Euspatangus cairensis*, *Thagastea luciani* ; FOURTAU (66) p. 84.—Nummulitic limestone near Sinai, *Echinolampas africanus* ; FOURTAU (69) p. 16.—Middle or lower Eocene, Aintâb, Syria, spp. of *Schizaster* and *Pericormus* ; KINKELIN (115) p. 162.—Mid. Eocene, Venetia and S. Tirol, n. spp. of *Brissopatagus*, *Linthia*, and *Echinolampas* ; OPPENHEIM (163).

Lutetian—Calcaire grossier supérieur in Gironde, near Blaye, list of *Ech.* esp. *Linthia* ; ENGERRAND (58) : road from Ecos to Dampmesnil (Eure), *Macropneustes minor* ; CANU (48) in Zool. Rec. 1897.

Jackson stage, N. W. Louisiana, *Scutella* ; VAUGHAN (211).

(iii) MESOZOIC.

a. **General** :—Vacant.

b. **Cretaceous** :—Echinodermal evidence as to depth at which the Chalk was deposited (p. 506), as to rapidity (p. 542), as to currents (pp. 545, 551, 552) ; CAYEUX (30).—Isle of Purbeck and Weymouth, lists of Echinoderma &c. as under Jurassic, q. v. ; STRAHAN (203).—*Ech.* and *Crin.* in drift, Saxony ; SIEGERT (197).—Cuba, spp. of *Salenia*, *Cyphosoma*, *Codiopsis*, *Echinoconus*, *Discoidea* ; EGOZCUE (55).

1. Upper :

Lower Garumnian, Rivière, Landes, n. spp. of *Brissopneustes* and *Hemigymnia* ; ARNAUD (10) p. 111.

Danian :—of Scania, list of *Ech.* incl. *Holaster faxensis* n. sp. and

Pyrina freucheni; HENNIG (95).—Of Faxö, *Cidaris forchhammeri* does not occur; SCHLUETER (194) p. 904.

Senonian:—distribution of *Marsupites*, *Micraster coranguinum*, *Echinoconus conicus*, and *Offaster pillula* near Eastbourne; JUKES-BROWNE in REID (183) pp. 7, 8.—Near Marlborough, *Marsupites*, *Pentagonaster megaloplax*, and list of *Ech.*; MEYRICK (152).—White Chalk with Flints, Flamborough Head, Yorkshire, *Bourgueticrinus*?; LAMPLUGH (129) p. 181.—Zone of *Micraster cor-testudinarium*, Cambridgeshire, *Ech.*; REED (182) p. 152.—Road from Subiaco to Jenne, Italy *Ananchytes* cf. *ovata*; ANGELIS D'OSSAT (9) p. 286.—Jalomitza and Dimbovitza, Roumania, list of *Ech.*; POPOVICI-HATZEG (177) p. 123.—Pestera in Dobrogea, *Hemiaster*, *Cardiaster*, *Echinoconus*; ANASTASIU (6).—Caucasus, *Echinocorys vulgaris*; KARAKASCH (103) pp. 9 & 30.—Senonian?, Algeria, *Guettaria danglesi*, n. sp.; GAUTHIER (76) p. 831.—Relics of former beds at Mokattam, Cairo, *Echinoconus albogalerus* and *Cidaris clavigera*; FOURTAU (65) p. 100. Lower Senonian, Trümmerkalk of Scania, spp. of *Cardiaster* and *Cidaris* discussed, some new; SCHLUETER (194). Lower Coniacian to Upper Campanian of Dordogne and Charente Inférieur, *Cidaris pseudopistillum*; ARNAUD (10) p. 109. Niobrara, lower part of *Hesperornis* beds, W. Kansas, *Uintacrinus*; LOGAN (133).

Turonian.—Zone of *Holaster planus*, Cambridgeshire; REED (182) p. 145.—Chalk Rock, zone of *Heteroceras reussianum*, Cambridgeshire, *Ech.* and *Crin.*; REED (182) p. 148.—Abu Roasch, Egypt, *Coptosoma*; GREGORY (89) p. 152.—Pestera in Dobrogea, *Echinoconus subrotundus*; ANASTASIU (6).—"Weissenberger Etage im Egergebiete," Bohemia, *Micraster*, *Holaster*, *Stellaster quinqueloba*; ZAHÁLKA (228) p. 76.

Cenomanian:—Cambridgeshire, Chalk Marl, *Ech.* (p. 126): Totternhoe stone, zone of *Holaster subglobosus*, *Ech.*, *Crin.* (pp. 131, 134): zone of *Rhynchonella cuvieri*, *Ech.* (pp. 139, 141): zone of *Terebratulina gracilis*, *Ech.* (p. 143); REED (182).—Wilmington near Honiton, list of *Ech.* (pp. 244, 245) with note on spp. of *Holaster* (p. 246); JUKES-BROWNE (108).—Sinai, *Hemiaster*, *Holactypus*; FOURTAU (69) pp. 9, 11, 13. Middle Cenomanian, Angoulême, *Galeropygus jolyi*, n. sp.; GAUTHIER (76) p. 836. Lower Cenomanian, N. of Trujillo, Peru, *Enallaster tschudii*, also geogr. distrib. of *Enallaster*; DOUVILLÉ (51). Seewerkalk, Piz Dartgas, Switzerland, *Cidaris*, *Holaster*; TOBLER (207) p. 75.

Albian, Upper Gault of Wissant, *Cidaris gaultina*; JUKES-BROWNE (107).—Cambridge Greensand, *Ech.*, *Ast.*, *Crin.* (p. 111): Red Chalk of Hunstanton, *Ech.*, *Crin.* (p. 90): Gault, Cambridgeshire, *Pseudodiadema*, *Pentacr.* (p. 82); REED (182).

2. Lower:

Aptian or Vectian, Moreseat, Aberdeen, *Ananchytes* (?*Cardiaster*), *Discoidea*, *Echinocyphus*, *Enallaster*, *Echinoconus*; JUKES-BROWNE (109) p. 30. Lower Greensand, Upware, Cambridgeshire, *Ech.*; REED (182) p. 69.

Neocomian, Piz Dartgas, Switzerland, *Toxaster*; TOBLER (207) p. 75.—Dealu Sasului, Roumania, *Cidaris*; POPOVICI-HATZEG (177) p. 97.—Caucasus, *Pseudodiadema bourgueti*, *Holactypus macropygus*; KARAKASCH (103) pp. 13, 32.

c. **Jurassic**:—Isle of Purbeck and Weymouth, lists of Echinoderma and other fossils, mostly compiled, apparently without revision, from previous authors, and illustrated by quaint old woodcuts; STRAHAN (203).

1. Upper:—

Portlandian (=Tithonian); Törzburger pass, Roumania, *Ech.* and *Crin.*; SIMIONESCU (198) p. 26: of Franche-comté, E. France, list of *Ech.*; GIRARDOT (78) p. 381.

Kimeridgian:—Kimeridge Clay, Cambridgeshire, *Cidaris*; REED (182) p. 46. Franche-comté, E. France, Virgulian (=Upper Kimeridgian), list of *Ech.* and *Crin.* (pp. 346, 347): Pterocerian (=Lower Kimeridgian), list of *Ech.* and *Crin.* (p. 335); GIRARDOT (78).

Sequanian:—Corallian, Upware, Cambs., spp. of *Collyrites*, *Echinobrissus*, *Holactypus*, *Hyboclypus*, *Pygaster*, *Cidaris*, and *Pentacrinus*, also *Hyboclypus gibberulus* from Elsworth rock of St Ives; WEDD (216).—Coral Rag and Coralline Oolite, Upware, Cambridgeshire, *Ech.* and *Crin.* (pp. 37, 38): Amphill Clay, Cambridgeshire, *Cidaris* and *Pentacr.* (p. 28); REED (182).—St. Clement-lès-Macon, *Hemicidaris crenularis*; LISSAJOUS (131). Astartian of Franche-comté, E. France, list of *Ech.* and *Crin.*; GIRARDOT (78) pp. 324, 325.

2. Middle:—

Argovian,—Lower Calcareous grit, Cambridgeshire, *Ech.* and *Crin.*; REED (182) p. 23. Rauracian of Franche-comté, E. France, list of *Ech.* and *Crin.*; GIRARDOT (78) pp. 235–237.—Of Kandern in Baden, *Cidaris florigemina*; BOEHM (20) p. 680.

Oxfordian,—Cambridgeshire, *Acrosalenia*, *Pentacr.*; REED (182) p. 14.—Of Franche-comté, E. France, list of *Ech.*, *Ast.* and *Crin.*, horizon of some considered doubtful; GIRARDOT (78) pp. 211–213.—Around Lons-le-Saunier, Jura, localities and horizons of spp. of *Cidaris*, *Pseudodiadema*, *Astropecten*, *Pentacr.*, *Balanocr.*; GIRARDOT (79) p. 626.—Of Macon, “Marnes gris-bleuâtre d’Hurigny,” *Pentagonaster jurensis*, *Balanocrinus subteres*; Marnes et calcaires de Gaises, *P. jurensis*, *B. subteres*, *Pentacr. cingulatus*, *R. stockhornensis*, *Cidaris coronata*, *Rhabdocidaris caprimontana*; LISSAJOUS (130).—Of Caucasus, *Collyrites* cf. *loryi*, *C. sp.*, *Holactypus* sp., *Rhabdocidaris* sp., *Cidaris* sp.: of Daghestan, *Collyrites læwinsoni*; SPENDIAROFF (202).—*Cardioceras cordatum* beds,—S. of Windgälle, Switzerland, *Pentacr.* (pp. 69, 101): Birmenstorfer beds *Pentacr.*, *Eugeniocr.* (pp. 70, 102), *Cidaris* (pp. 73, 103); TOBLER (207).—*C. cordatum* beds, Kandern in Baden, *Millericrinus horridus*; BOEHM (20) p. 675.—Valea Lupului, Roumania, *Cidaris*, and bed of Crinoid stems; POPOVICI-HATZEG (177) p. 79.

Callovian of Franche-comté, E. France, list of *Ech.* and *Crin.*; GIRARDOT (78) p. 137.—Around Lons-le-Saunier, Jura, localities and horizons of spp. of *Collyrites*, *Pygurus*, *Echinobrissus*, *Holactypus*, *Pygaster*, *Cidaris*, *Rhabdocidaris*, *Acrosalenia*, *Hemicidaris*, *Pseudodiadema*, *Cidaropsis*, *Stomechinus*, *Pentacrinus*, *Cyclocrinus*; GIRARDOT (79) pp. 371–625.—Caucasus, *Collyrites warwaræ*, *Holactypus* sp.; Daghestan, *Collyrites elliptica*, *C. cf. analis*, *C. sp.*; SPENDIAROFF (202).

3. Lower:—

Bathonian,—Franche-comté, E. France, Cornbrash, list of *Ech.* and *Crin.* (p. 127).—Great Oolite, list of *Ech.* (pp. 87, 88); GIRARDOT (78).—Around Lons-le-Saunier, Jura, localities and horizons of spp. of *Collyrites*, *Clypeus*, *Echinobrissus*, *Galeropygus*, *Holactypus*, *Pygaster*, *Cidaris*, *Acrosalenia*, *Pseudodiadema*, *Hemicidaris*, *Pseudocidaris*, *Stomechinus*, *Pentacr.*, *Apiocr.*; GIRARDOT (79) pp. 337–570.—La Sorguette near Bandol (Var), *Pentacrinus nicoleti*, *Apiocrinus*, *Pseudodiadema pentagonum*, *Cidaris bathonica*, *C. kœchlini*, *C. babeau*; CAZIOT (29).—Caucasus, *Collyrites rostrata*, *C. analis*, *Echinobrissus clunicularis*, *Clypeus* sp.; Daghestan, *Echinobrissus* sp.; SPENDIAROFF (202).

Bajocian, N. of Franche-comté, E. of France, various localities and lists of fossils, *Ech.*, *Ast.* and *Crin.*, with special reference to Crinoid Limestone; KILIAN & PETITCLERC (113) passim; PETITCLERC (174) pp. 48, 55, and annotated list, pp. 124–132; detailed remarks on spp. of *Galeropygus*, *Hyboclypeus*, *Echinobrissus*, *Cidaris*, *Clypeus*, *Stomechinus*, *Hemipedina*, and *Pygaster*; LAMBERT (128).—Franche-comté, immigration and growth of Pentacrinids, their relation to coral colonies (pp. 65, 66), list of *Ech.* *Ast.* and *Crin.* in the district (p. 73); GIRARDOT (78).—Around Lons-le-Saunier, Jura, localities and horizons of spp. of *Cidaris*, *Rhabdocidaris*, *Stomechinus*, *Echinobrissus*, *Pentacr.*; GIRARDOT (79) pp. 190–336, 711–766.—At Château-neuf d'Entraunes (Alpes maritimes) *Eugeniocrinus*; BERTRAND (19).—Upper Bajocian near Basle, *Rhabdocidaris horrida*, *Pedina inflata*, *Cainocrinus andreae*; GREPPIN (90) pp. 8–11.—*Humphriesianus* beds, Rotsteinthal, Switzerland, *Pentacr.*, *Cidaris* (pp. 34, 86), *Opalinus* beds, *Pentacr.* (p. 31), Engelbergthal, *Cidaris* (p. 41), Gadmerflühe, *Pentacr.* (p. 47), Krämer on Sandalp, *Cidaris*, *Pentacr.* (pp. 71, 92), Erstfelderthal, *Pentacr.*, *Cidaris* (p. 91); TOBLER (207). Brown Jura, Strunga and Coltu Tătarului, Roumania, list of *Ech.*; POPOVICI-HATZEG (177) p. 69. Inf. Oolite, Chile, *Stomechinus*; FUCINI (71) p. 2.

d. **Lias**:—Upper or Toarcian,—around Lons-le-Saunier, Jura, localities and horizons of spp. of *Pentacr.*, special notes; GIRARDOT (79) pp. 149–189, 666, 687.—Kessik-tash, W. of Angora, *Pentacr.* sp.; POMPECKJ (176) p. 727.

Middle or Liasian,—around Lons-le-Saunier, Jura, localities and horizons of spp. of *Pentacr.*, *Extracr.*, *Balanocr.*, *Rhabdocidaris*; GIRARDOT (79) pp. 123–148, 656.—Mediterranean province *Pentacrinus* fauna contrasted with that of Middle Europe; POMPECKJ (176) p. 757.—Near Rgotina, E. Servia, *Pentacr. basaltiformis* and *Cidaris*; RADOVANOVIĆ (181) pp. 50, 51.—Mt. Laila, N.W. of Lentechi, Suanetia, S.W. Caucasus, *Pentacr.* columnal found by V. Sella=*P. laevisutus* q. v.; AMMON (4).—Zone of *Amaltheus margaritatus*, Kessik-tash, W. of Angora, *Pentacr. laevisutus*, and *P. goniogenos*, n. spp., the former also in Laila Mts. in Suanetia; POMPECKJ (176).

Lower or Sinemurian,—around Lons-le-Saunier, Jura, localities and horizons of spp. of *Pentacr.*, *Extracr.*, *Balanocr.*, *Cyclocr.*; GIRARDOT (79) pp. 79–122, 651.—Kandern in Baden, *Pentacrinus tuberculatus*; BOEHM (20) p. 669.

e. **Trias**:—Muschelkalk,—*Encrinus liliiformis* at Zibil in the Dobrudscha, Bulgaria; ANASTASIU (5) p. 892.

(iv) PALÆOZOIC.

a. **General**:—Vacant.

b. **Permian**:—Zechstein of Germany, *Crin.*, *Ech.*, *Oph.*, *Hol.*; SPANDEL (201).

c. **Permo-Carboniferous**:—Kama basin, Russia in Europe, *Cyathocr.*, *Palaeochinus*, *Archæocidaris*; STUCKENBERG (204) pp. 167, 173, 270, 294, 354, 360. Kungur beds, Kama basin, *Cyathocrinus* cf. *ramosus*; ROMANOV (184) p. 10.

d. **Coal Measures**:—Of Ohio, *Cyathocr.* and *Zeacr.*; WHITFIELD (223) p. 596.

- Upper Coal Meas.—Kansas City, Mo., n. spp. *Crin.*; BUTTS(25).—Kansas, *Hydreionocrinus kansasensis*, n. sp.; WELLER (217).
- Missourian series, Bethany Limestone, Bethany, Mo., and Grand R., near Decatur, Ia., *Eupachyrcrinus verrucosus* (pp. 273, 278): Earlham Limestone, near Davis city, Decatur Co., Ia., *Archæocidaris* and *Zeacrinus* (p. 280); BAIN (11).
- e. **Lower Carboniferous**:—Calderwood Limestones near East Kilbride, crinoid columnals (p. 64) and *Archæocidaris* (p. 77); NEILSON (159).—Near Berwick on Tweed, *Archæocidaris*, *Poteriocrinus*; GUNN (92) p. 30.—Lower Brown Limestone at Eyarth near Ruthin, N. Wales, *Archæocidaris urei*; MORTON (158) p. 319.
- Horizon Vla of Pair, Belgium, *Actinocrinus tenuis*, *Platycrinus arenosus*; DESTINEZ (47) p. xxxvi.
- Base of Viséen, black marble of Denée, *Archæocidaris* n. sp., *Palæchinus* 2 n. spp., and *Scaphiocrinus* sp.; SOREIL (200) p. lxxix; also “un bel oursin dans les marbres noirs des bords de la Meuse au Sud de Houx”; DORLODOT in SOREIL (200) p. lxxxiii.
- Kama basin, Russia in Europe, *Cyathocr.*, *Poteriocr.*, *Archæocidaris*, *Palæchinus paradoxus*; STUCKENBERG (204) pp. 156, 231, 343.
- Maxville Limestone (=Chester Group) Ohio, *Cyathocr.* [?], *Pentremites*; WHITFIELD (223) p. 577.
- Osage crinoid fauna of central N. America, compared with that of W. Europe, and with the Waverly fauna of N. America; WELLER (218) pp. 308–312.
- f. **Devonian**:—Upper,—Psammites du Condroz, Belgium, *Dinocystis barroisi* n. g. et sp.; BATHER (16 A) p. 543.
- Middle:—Lenneschiefer, Rhine provinces, *Crin.*; WINTERFELD (226) pp. 4, 11, 12, 23, 29.—Hamilton Group, Ohio, list of spp. from below and above bone-bed, *Crin.*; WHITFIELD (223) pp. 539, 544, 553.—Charlestown, Ind., *Dolatocr. depressus*; MILLER in GREENE (88).—Ontario, revised list of *Crin.*, *Ast.*, *Blast.*, with n. spp. of *Dolatocrinus* and *Gennæocrinus*; WHITEAVES (222) pp. 368–376.—Cedar Valley Limestone, at Littleton on R. Wapsipinicon, Buchanan Co., Ia., *Megistocrinus farnsworthi*; CALVIN (27) p. 232.
- Milwaukee, Wis., n. spp. of *Melocr.* and *Pentremitidea*; WELLER (219).—Rio Maecurú, Amazons, *Ctenocrinus* (?) columnals (p. 6); ERERÉ, stem-fragments (p. 15); KATZER (110).
- g. **Silurian**:—Gotland, reef-building *Crin.*; WIMAN (225) pp. 319, 322 & 323.—*Crin.* in Drift, Saxony; SIEGERT (197).—Black limestone of Podol, E. Bohemia, *Lobolithus*; JAHN (105) pp. 217–220.—Valley of R. Galbe, Camelas, and Castelnou, E. Pyrenees, *Scyphocr. elegans*; ROUSSEL (186) pp. 282, 284.
- Comparison of Crinoid fauna of central N. America with that of W. Europe, and contrast with N. York fauna, presence of *Crotalocrinus*, *Corymbocrinus*, *Pycnosaccus*, *Petalocrinus*, in Mississippian region and N.W. Europe; WELLER (220) pp. 700–702.—Distribution of spp. of *Petalocrinus* in Iowa and Gotland, with evidence as to homotaxy of beds; BATHER (16) p. 402.
- Crinoidal limestones of Clinton and Niagara age in Ohio and Indiana, with localities of *Pisocr. gemmiformis* and *Stephanocr. osgoodensis*, *Palæaster*, and *Agelacrinus*; FOERSTE (62) pp. 169, 170, 171, 173, 177, 183, 184, 185, 186, 195, 197, 198, 199.—Niagara Limestone, Delaware Co., Ia. *Caryocrinus ornatus*, *Eucalyptocrinus crassus*; CALVIN (26) pp. 149, 157.
- h. **Ordovician**:—Étage 5, Upper *Chasmops* beds near Kristiania, *Echinosphæra* (p. 34), *Meristella crassa* beds in Ringerike, *Sphæronis* and *Caryocrinus* (p. 17); KIAER (112).

Assise de Gembloux, at Fauquez-Ittre, Belgium, *Sphæronis munitus*, *S. punctatus*; MALAISE (144) p. lxxvi.

Caradoc, between Arville and Wierde, at Fosse, and at Vitrival, (Sambre-et-Meuse), *Glyptocrinus basalis*, *Echinosphæra baltica*, *Sphæronis stelluliferus*; MALAISE (145) p. 258.—*Cyst.* in drift, Saxony; SIEGERT (197).—Valley of R. Galbe, E. Pyrenees, *Echinosphæra*; ROUSSEL (186), p. 282.

Trenton Limestone, near Montreal, *Glyptocystis logani*, *Heterocrinus tenuis*; AMI (3) p. 48.

Chazy Limestone, near Montreal, *Bolboporites americanus*, *Malocystis murchisoni*, *Blastoidocrinus carchariædens*; AMI (3) p. 48.

IV. SYSTEMATIC†.

(A.)—ECHINODERMA IN GENERAL.

Vacant.

(B.)—HOLOTHURIOIDEA.

Acanthotrochus, incl. 1 sp., *mirabilis*; ÖSTERGREN (167) p. 119.

Anaperus peruanus Trosch., is a *Thyone*, and distinct from *Holothuria peruviana* Lesson; LUDWIG (138) p. 439.

Anapta, referred to *Synaptinae*, with spp. *A. fallax* and *A. gracilis*, but *A. subtilis* Sluiter is only a regenerating individual; ÖSTERGREN (167) p. 117. *A. fallax*; LUDWIG (137) p. 70: colour in life; LUDWIG (138) p. 445.

Ankyroderma danielsseni; LUDWIG (137) p. 65. *A. loricatum*, probably intended as **n. sp.**, 1090–2425 metres, locality not stated; and *A. maroccanum*, **n. sp.**, depth and locality not stated; PERRIER (172) C.R. Ac. Sci. cxxvi, p. 1666.

†*Annulina quinquelobata* Terquem as Foraminifer, is spicule of Chirodote holothurian; SPANDEL (201) p. 42.

Auricularia coarctata, **n. sp.**, coast of Brazil and ? Sargasso sea; (156) p. 22, pl. i, and (157) p. 18, pl. i; *A. minor*, **n. sp.**, near Fernando Noronha; (156) p. 26, pl. i, and (157) p. 21, pl. ii; *A. nudibranchiata*, probably an Elasipod; (156) p. 28, and (157) p. 22; *A. paradoxa*, **n. sp.**, S. Equatorial current; (156) p. 26, pl. i, and (157) p. 21, pl. i; *A. plicata*, **n. sp.**, Bermudas; (156) p. 27, pl. ii, and (157) p. 22, pl. ii; *A. simplex*, **n. sp.**, Bermudas; (156) p. 16, pl. i, and (157) p. 14, pl. i; *A. sphærigera*, **n. sp.**, = “*Auricularia mit Kugeln*” of Müller *pars*, Trieste; (156) p. 23, and (157) p. 19; *A. stelligera*, **n. sp.**, “*Auricularia mit Kugeln*” of Müller *pars*, Marseilles and Nice; (156) p. 24, text-fig. 1, and (157) p. 19, text-fig. 1: MORTENSEN.

Bathyplores moseleyi; LUDWIG (137) p. 8.

Benthothuria, **n. g.**, genotype *B. funebris*, **n. sp.**, 782–1230 metres, locality not stated; PERRIER (172) C.R. Ac. Sci. cxxvi, p. 1665.

† A dagger prefixed to the trivial name of a species indicates that it is fossil; prefixed to the name of the author, it denotes that the reference is to the species in a fossil state; prefixed to the name of a genus, it indicates that all species of the genus here recorded are fossil, and the † is therefore not repeated before each name. The abbreviations *l. c.* and *op. cit.* refer only to the place or work quoted immediately before.

A name and reference quoted without further statement (e.g. *Ankyroderma danielsseni*; LUDWIG, *supra*) indicate that the quoted author's statement refers merely to locality or some question of slight importance. Further information can usually be gleaned from the cross-references under TITLES.

- Caudina coriacea*, note on spicules; LUDWIG (137) p. 63: anal papillæ, radiating muscles, circumanal ampullæ, mode of life; DENDY (45): thrown up by storm; DENDY (46) p. 323.
- Chiridota* restricted to 17 spp., for others see *Sigmodota*; ÖSTERGREN (167) p. 118. *C. contorta*, distrib., spicules, gonads, diœcious, protection of brood in ovaries, young described; LUDWIG (137) p. 73, pl. iii. + *C. costifera*; SPANDEL (201) p. 43. *C. dunedinensis*, referred to *Trochodota*; LUDWIG (137) p. 87. *C. fernandensis*, **n. sp.**, Juan Fernandez; LUDWIG (138) Zool. Jahrb., Suppl. 4, Fauna Chilensis, Heft ii, p. 446. + *C. florida*; SPANDEL (201) p. 43. + *C. geinitziana*, **n. sp.**, Zechstein of Galgenberg, W. of Ranis in Thuringia; SPANDEL (201) Abh. Ges. Nürnberg, xi, p. 28, pl. xiii: LAMBERT in Review corrects [!] this to *geinitzi*. *C. pisanii*, spicules, gonads, and other notes, incl. *C. purpurea* Theel non Lesson; LUDWIG (137) p. 71: colour in life, with internal parasite, probably *Entocolax*; LUDWIG (138) p. 445. *C. purpurea* discussed; LUDWIG (137) p. 67. *C. purpurea* Lesson, see *Trochodota*.
- Chiridotinæ*, sub-fam. of *Synaptidæ*, incl. *Sigmodota* and *Chiridota*; ÖSTERGREN (167) p. 117.
- Chondroclæa*, **n. g.** of *Synaptinæ*, no genotype, but spp. in two sections: *A. indivisa*, *kallipeplos*, *kefersteini*, *lactea*, *nigra*, *orsinii*, *psara*, *recta*, *reticulata*, *striata*, *tenuis*, *vivipara*, *B. beselii*; ÖSTERGREN (167) Ofv. Ak. Forh. lv, p. 113.
- Cladolabes viridimana* Phil., 1860, original description reprinted = *Phyllophorus chilensis* Semper and *Eucyclus duplicatus* Lampert; LUDWIG (140).
- Colochirus armatus*, course of gut; ÖSTERGREN (165) p. 103. *C. brevidentis* Hutton, from Juan Fernandez, incl. *C. calcareus* Dendy, redescri., spicules figd.; LUDWIG (138) p. 442, pl. xxvi. *C. montagui*; GADEAU DE KERVILLE (74) p. 340. *C. ocnoides*, thrown up in millions by storm; DENDY (46) p. 323: is a *Cucumaria*, perhaps also are *C. calcareus* and *C. brevidentis*; LUDWIG (137) p. 30. *C. quadrangularis*, course of gut; ÖSTERGREN (165) p. 103. *C. robustus*, **n. sp.**, Strait of Korea (p. 134), course of gut (p. 103); ÖSTERGREN (165) Zool. Anz. xxi.
- Cucumaria abyssorum*; LUDWIG (137) p. 39: variations from Lampert's description; ÖSTERGREN (165) p. 104, footnote. *C. alba*, divergencies from Dendy's account, not a *Colochirus*; LUDWIG (137) p. 29. *C. (Semperia) bermudiensis*, validity questioned; CLARK (34) pp. 411, 413. *C. chiloensis*; LUDWIG (137) p. 38. *C. crocea*, additions to previous description, esp. genital organs ♂, and young; LUDWIG (137) p. 15, pl. i. *C. frondosa*, Cuvierian organs not to be found; ÖSTERGREN (165) p. 108. *C. godeffroyi*, distinct from *C. crocea*, redescri., spicules figd., colour in life; LUDWIG (138) p. 435, pl. xxvi. *C. georgiana* incl. *C. pithacnion*; LUDWIG (137) p. 38. *C. huttoni*, peculiar distrib. of podia, and other notes; LUDWIG (137) p. 39. *C. (olim Siphothuria) incurvata* (E. Perrier), short diagnosis; PERRIER (172) p. 1666. *C. koreensis*, **n. sp.**, Strait of Korea; ÖSTERGREN (165) Zool. Anz. xxi, p. 109. *C. lævigata*, incl. *C. serrata* cum varr., changes in growth of spicules, colour in life, distribution and habitat, additions to Lampert's description of young; LUDWIG (137) p. 32. *C. leonina*, colour in life; LUDWIG (138) p. 434: incl. *C. dubiosa* *C. salmini*, *C. mendax*, and *Ocnus vicarius*, distrib., notes on spicules; LUDWIG (137) p. 36. *C. longicauda*, **n. sp.**, Japan or China (p. 108, text-fig.), course of gut (p. 105), respiratory trees (p. 108); ÖSTERGREN (165) Zool. Anz. xxi. *C. ocnoides*; LUDWIG (137) p. 30. *C. parva*, protection of brood, young described and figd.; LUDWIG (137) p. 25, pl. i. *C. planci*, *Auricularia*; MORTENSEN (156), p. 29, and

- (157) p. 23. *C. punctata*, Bermuda, some variations from type; CLARK (34) pp. 411, 413. *C. squamata*, n. sp., Betsy Cove, Kerguelen Id., spicules figd.; LUDWIG (137) Hamburg. Magalhaens. Sammelreise, p. 27, pl. i. *C. steineni*, n. sp., S. Georgia and Port Stanley = *Thyone muricata* Lampert non Studer, spicules figd.; LUDWIG (137) op. cit. p. 30, pl. ii.
- Deima atlanticum*, n. sp., 4360 metres, 38° 54' N., 23° 27' W.; HEROUARD (100) text-figg. 1 & 2.
- Euapta*, n. g. of *Synaptinae*, no genotype, but spp. in two sections: *A. godeffroyi*, *lappa*, *polii*, *B. glabra*, *grisea*, *serpentina*; ÖSTERGREN (167) Ofv. Ak. Forh. lv, p. 112.
- Eucyclus duplicatus* Lampert, syn. of *Phyllophorus chilensis* Semper; LUDWIG (138) p. 439.
- † *Hemisphaeranthos costifer* et *floridus* Terq. referred to *Chirodota*; SPANDEL (201) p. 43.
- Herpysidia*, n. g., genotype *H.* (olim *Stichopus*) *tizardi* Théel: and *H. reptans*, n. sp., 2115 metres, locality not stated; PERRIER (172) C.R. Ac. Sci. cxxvi, p. 1665.
- Holothuria abbreviata*, probably abnormal *H. captiva*; CLARK (34) p. 413. *H. floridana*; l. c. *H. forskali*, genital lacuna, dorsal mesentery and rete intestinalis; RUSSO (189). *H. impatiens*, respiratory trees; BORDAS (21): growth-change in spicules, the young being *H. aphanes*; ÖSTERGREN (166). *H. intestinalis* referred to *Mesothuria*; PERRIER (172) p. 1665. *H. lactea*, Théel, see *Zygothuria*. *H. limbata*, n. sp., 564 metres, locality not stated; PERRIER (172) C.R. Ac. Sci. cxxvi, p. 1665. *H. lubrica* Sel., incl. *H. parva*, *H. erinaceus*, *H. glaberrima*, variations in number of Polian vesicles, stone-canals, and Cuvierian organs, also in shape of spicules; LUDWIG (138) p. 434. *H. murrayi* referred to *Mesothuria*; PERRIER (172) p. 1665. *H. platei*, n. sp., coast of Juan Fernandez; LUDWIG (138) Zool. Jahrb., Suppl. 4, Fauna Chilensis, Heft ii, p. 432, pl. xxvi. *H. poli*, respiratory trees; BORDAS (21): see under II, B, i, b, 7; RUSSO (188): genital lacuna; RUSSO (189). *H. poli* of Russo's previous papers is *H. forskali*, while *H. stellati* of Russo's previous papers is *H. poli*; RUSSO (189) p. 115. *H. surinamensis*?, Bermuda; CLARK (34) p. 413. *H. tubulosa*, respiratory trees; BORDAS (21): unripe ovum and response to spermatozoon; IWANZOFF (104): dissection: KÜKENTHAL (123) p. 125: genital lacuna, dorsal mesentery and rete intestinalis; RUSSO (189): *Auricularia*, redescr.; MORTENSEN (156) p. 17, and (157) p. 14. *H. verrilli* referred to *Mesothuria*; PERRIER (172) p. 1665.
- Hypsilothuria* [olim et melius *Ypsilothuria*] *attenuata* E. Perrier = *Sphaerothuria bitentaculata* Ludwig, 2325 metres: *H. talismani*, 1123 metres; PERRIER (172) p. 1666.
- Kolga hyalina*, coil of gut not abnormal; ÖSTERGREN (165) p. 102.
- Labidoplax*, n. g. of *Synaptinae*, no genotype, but spp. in two sections: *A. tenera*, *B. digitata*, *dubia*, *incerta*, *thomsoni*; ÖSTERGREN (167) Ofv. Ak. Forh. lv, p. 115.
- Mesothuria intestinalis*; PERRIER (172) p. 1665. *M. magellani*; LUDWIG (137) p. 8. *M. maroccana*, n. sp., 2200 metres, locality not stated; PERRIER (172) C.R. Ac. Sci. cxxvi, p. 1665. *M. murrayi*; PERRIER (172) p. 1665. *M. thomsoni*; LUDWIG (137) p. 9. *M. verrilli*; PERRIER (172) p. 1665.
- Myriotrochine*, sub-fam. of *Synaptidae*, incl. *Myriotrochus*, *Trochoderma*, *Acanthotrochus*; ÖSTERGREN (167) p. 119.
- Myriotrochus*, incl. 2 spp., *rinki* and *vitreus*; ÖSTERGREN (167) p. 119. *M. rinki*, coil of gut not abnormal; ÖSTERGREN (165) p. 102.
- Ocnus compressus*, n. sp., 627 metres, locality not stated; PERRIER (172) C.R. Ac. Sci. cxxvi, p. 1666.

- Orcula*, syn. of *Phyllophorus*; ÖSTERGREN (165) p. 103, footnote.
- Pælopatides grisea*, **n. sp.**, 1918–4060 metres, locality not stated; PERRIER (172) C.R. Ac. Sci, cxxvi, p. 1665.
- Phyllophorus chilensis* has 20 tentacles, incl. *Eucyclus duplicatus* Lamp., colour in life and in spirit, its food, protection by stones; LUDWIG (138) p. 439: syn. of *P. viridimana* Phil. sp.; LUDWIG (140). *P. drummondi*; LÖNNBERG (134) p. 46. *P. longidentis*; LUDWIG (137) p. 49. *P. mollis*, red in life, variation in size of tentacles, probably = *Holothuria peruviana* Lesson; LUDWIG (138) p. 437. *P. pellucidus*, colour, protection by zostera leaves; LÖNNBERG (134) p. 46.
- +*Prosynapta*, **n. g.** based on anchors; SPANDEL (201) Abh. Ges. Nürnberg, xi, p. 41: preocc. Cuénot et alii pro genere ficto, apud LAMBERT in Review. *P. eiseli*, **n. sp.**, Zechstein of Galgenberg, W. of Ranis in Thuringia; SPANDEL (201) p. 44, pl. xiii.
- Protankyra*, **n. g.** of *Synaptinae*, no genotype, but incl. *abyssicola*, *aculeata*, *asymmetrica*, *autopista*, *bankensis*, *benedeni*, *bidentata*, *brychia*, *challengeri*, *distincta*, *innominata*, *insolens*, *ludwigii*, *molesta*, *petersi*, *pseudo-digitata*, *rodea*, *similis*, *uncinata*, *verrilli*; ÖSTERGREN (167) Ofv. Ak. Forh. lv, p. 116.
- Pseudocucumis mixta*, **n. sp.**, West Norway, probably Molde (p. 135, text-fig.), position of respiratory trees (p. 105); ÖSTERGREN (165) Zool. Anz. xxi.
- Pseudopsolus*, **n. g.**, based on *Psolus macquariensis* Dendy, redescribed, ♂; LUDWIG (137) Hamburg. Magalhaens. Sammelreise, p. 49.
- Pseudostichopus atlanticus*, **n. sp.**, 4165 metres, locality not stated; PERRIER (172) C.R. Ac. Sci. cxxvi, p. 1665. *P. mollis* (p. 7), *P. villosus* (p. 8); LUDWIG (137).
- Psolidium dorsipes*; LUDWIG (137) p. 51.
- Psolus*, course of gut; ÖSTERGREN (165), p. 103. *P. antarcticus*, distrib., protection of brood on sole, description of young; LUDWIG (137) p. 53, pl. iii. *P. ephippifer*; LUDWIG (137), p. 51. *P. japonicus*, **n. sp.**, Japan, Strait of Tsugar; ÖSTERGREN (165) Zool. Anz. xxi, p. 135. *P. phantapus*; LÖNNBERG (134) p. 47: *Auricularia* [sic, but it is a Pupa, "Auricularia-Stadium unbekannt"]; MORTENSEN (156) p. 30, pl. i, and (157) p. 23, pl. i.
- Sigmodota*, referred to *Chiridotinae*, incl. *Toxodora ferruginea*, and *T. japonica*, *Trochodota dunedinensis*, *T. studeri*, and *T. venusta*, *S. australiana*, and *S. contorta*; ÖSTERGREN (167) p. 117. *S. purpurea* Studer, syn. of *Chiridota contorta*; LUDWIG (137) p. 82.
- Siphothuria incurvata*, vide *Cucumaria*.
- Sphærothuria bitentaculata* in Indian Ocean, perhaps = *Ypsilothuria* from Atlantic; KOEHLER (119). See *Hypsilothuria*.
- Stichopus diaboli*; CLARK (34) p. 413. *S. fuscus*, spicules first figd.; LUDWIG (137), p. 5, pl. i. *S. haytiensis*, perhaps syn. of *S. mæbii*; CLARK (34) p. 413. *S. japonicus*, spicules of young resemble those of old *S. regalis*; ÖSTERGREN (165) p. 134 footnote. *S. mæbii*, includes *S. xanthomela*; CLARK (34) p. 143. *S. mollis*, incl. *Holothuria robsoni* Hutton, and ? *S. fuscus*; LUDWIG (137) p. 7. *S. regalis*, respiratory trees; BORDAS. (21). *S. tizardi*, vide *Herpysidia*. *S. xanthomela*, v. *S. mæbii*. *S. sp.* shelters a fish; COUTIÈRE (38) p. 240.
- Synallactes challenger*; LUDWIG (137) p. 8. *S. crucifera*, probably intended as **n. sp.**, 2115 metres, locality not stated; PERRIER (172) p. 1665.
- Synallactinae*, intermediate in bathymetric distrib. and evolution between *Holothuriinae* and *Elasipoda*; PERRIER (172) p. 1664.
- Synapta*, restricted to 7 spp.: *albicans*, *gracilis*, *inhærens*, *macrankyra*, *ooplax*, *pourtalesii*, *roseola*: others referred to genera *Euapta*, *Chondroclæa*, *Labidoplax*, *Protankyra*, *Anapta*, qq. v.; ÖSTERGREN (167)

- p. 114. *S. digitata*, *Auricularia*, redescr. and distinguished from other "Auricularien mit Kalkrädchen," wheels figd.; MORTENSEN (156) p. 18, and (157) p. 15, text-fig. 5. *S. girardi*; DAVENPORT (42) p. 686 [v. *S. inhærens*]. *S. grisea*, 1 m. 50 long; COUTIÈRE (37) p. 155. *S. hispida* Heller, is a young *S. thomsoni*; LUDWIG (135) p. 8. *S. inhærens* (= *girardi*), breeding season; BUMPUS (24) p. 856. *S. macrankyra*, **n. sp.**, Naples; LUDWIG (135) Zool. Anz. xxi, p. 2. *S. picta*, see *S. vivipara*. *S. roseola*; DAVENPORT (42) p. 686. *S. vivipara*; CLARK (34) p. 413; GEROULD (77): Oersted, olim *Synaptula*, incl. *S. picta* Théel, distribution, habitat, habits, breeding, detailed account of development, general anatomy, and sense-organs; CLARK (32).
- Synaptinæ*, sub. fam. of *Synaptidæ*, incl. *Euapta*, *Chondroclea*, *Synapta*, *Labidoplax*, *Protankyra*, *Anapta*; ÖSTERGREN (167) p. 111.
- Synaptula*, see *Synapta vivipara*.
- Tesselatæ*, family including *Ypsilothuria*; PERRIER (172) p. 1666.
- Theelia* (? *Psolidium*) *disciformis* (? *Psolidium*) *incerta*, and *T. porifera*; LUDWIG (137) p. 51.
- Thyone anomala*, **n. sp.**, Strait of Formosa (p. 110), course of gut (p. 105), position of mesentery (p. 106); ÖSTERGREN (165) Zool. Anz. xxi. *T. briareus*, breeding season; BUMPUS (24) p. 856. *T. gadeana*, **n. sp.**, 106 metres, locality not stated; PERRIER (172) C.R. Ac. Sci. cxxvi, p. 1666. *T. lechleri*, not a *Thyonidium*, spicules descr. and figd., calcareous ring, and other notes, incl. *T. hassleri*; LUDWIG (137) p. 44, pls. ii & iii. *T. muricata*, redescrptions of type, see also *Cucumaria steineni*; LUDWIG (137) p. 41. *T. polybranchia*, **n. sp.**, China Sea (p. 133), respiratory trees (p. 107); *T. serrifera*, **n. sp.**, Norway, Trondhjemsfjord (p. 133, text-fig.), position of respiratory trees (pp. 106 & 107): ÖSTERGREN (165) Zool. Anz. xxi. *T. spectabilis*, incl. *T. meridionalis* and *cunninghami* of Bell, but specimen from Port Phillip is *T. okeni*; LUDWIG (137) p. 42.
- Toxodora*, vide *Sigmodota*.
- Trochoderma*, incl. 1 sp., *elegans*; ÖSTERGREN (167) p. 119.
- Trochodota*, vide *Sigmodota*. *T. dunedinensis*; LUDWIG (137) p. 87. *T. purpurea*; LUDWIG (138) p. 448: distrib., spicules, incl. *Chirodota australiana* and *C. studeri*; LUDWIG (137) p. 83, pl. 3.
- Trochostoma antarcticum*; LUDWIG (137) p. 65. *T. thomsoni*, coil of gut not abnormal; ÖSTERGREN (165) p. 102. *T. violaceum*; LUDWIG (137) p. 64.
- Ypsilothuria*, vide *Hypsilothuria* and *Sphærothuria*.
- Zygothuria*, **n. g.** genotype *Z. lactea* (Théel, olim *Holothuria*); and *Z. connectens*, **n. sp.**, 1975–2518 metres, locality not stated; PERRIER (172), C.R. Ac. Sci. cxxvi, p. 1665.

(C).—ECHINOIDEA.

- General account, division into *Palechinoidea* and *Euechinoidea* retained; LAHUSEN (127) p. 162.
- † *Acrosalenia*:—*A. cf. hemicidaroides* (pp. 345, 514), *A. lamarcki*, var. (pp. 576, 591), *A. cf. lycetti* (p. 345), *A. n. sp. aff. marioni* (pp. 576, 591), *A. spinosa* (pp. 345, 377, 415, 485, 509, 514, 591); GIRARDOT (79).
- Aerope fulva*, **n. sp.**, 1175–1772 fms., various stations in G. of Panama; AGASSIZ (2) Bull. Mus. Harvard, xxxii, p. 81, pl. viii.
- † *Agassizia*:—*A. nicaisii*, **n. sp.** (p. 64, pl. A xxiv), *A. tissoti*, **n. sp.** (p. 65, pl. A xxiv): Nummulitic Limestone, Algeria; POMEL (175).
- † *Amblypygus melitensis*, vide *Pseudohaima*.
- † *Amphidetus mediterraneus*; POMEL (175).

- †*Amphiope*:—*A. depressa*, **n. sp.**, Helvetian (p. 284, pls. B xii, xiv), *A. palpebrata*, **n. sp.**, Cartennian (p. 281, pl. B xi), *A. personata*, **n. sp.**, Cartennian (p. 285, pl. B xi bis), *A. villei*, **n. sp.**, Cartennian (p. 282, pl. B xi bis): Algeria; POMEL (175).
- †*Ananchytes* [melius *Ananchites*]:—*A. ovata*; SIEGERT (197) p. 96. *A. cf. ovata*; ANGELIS D'OSSAT (9) p. 286. "*A. subglobosus* Lmk." Desor, what can it be? perhaps *A. sulcatus*; SCHLUETER (194) p. 899. *A. sulcata*; SIEGERT (197) p. 96. See also *Echinocorys*.
- †*Anapesus*:—*A. ? afer*, **n. sp.**, Pliocene (p. 306, pl. C iii), *A. angulosus*, **n. sp.**, Pliocene (p. 305, pl. C vi), *A. interruptus*, **n. sp.**, Helvetian (p. 300, pls. C v, xiii), *A. maurus*, **n. sp.**, Sahelian (p. 302, pl. C vii), *A. sahelienensis*, **n. sp.**, Sahelian (p. 301, pl. C iii), *A. serialis*, **n. sp.**, Pliocene (p. 303, pl. C iv), *A. tuberculatus*, **n. sp.**, Helvetian (p. 298, pls. C v, xiii): Algeria; POMEL (175).
- †*Anizaster gibberulus*; FOURTAU (66) p. 84.
- Arbacia*, development under acid and alkali; LOEB (132). †*A. massylea*, **n. sp.**, Cartennian, Algeria; POMEL (175) p. 316, pl. C xiv. *A. punctulata*; DAVENPORT (42) p. 686: 4-rayed as concerns ambulacra, but 5-rayed gonads; OSBORN (164): breeding season; BUMPUS (24) p. 855: *Echinopluteus*, redescr.; MORTENSEN (156) p. 123, and (157) p. 87. *A. pustulosa*; KOEHLER (117) p. 9: PALLARY (168): bastard larva; DRIESCH (54): *Echinopluteus*, redescr.; MORTENSEN (156) p. 119, text-fig. 11, and (157) p. 84, text-fig. 11.
- †*Arbacia asperata*, **n. sp.**, Sahelian (p. 314, pl. C x), †*A. badinski*, **n. sp.**, Helvetian or Sahelian (p. 314, pl. C xi), †*A. nicaisii*, **n. sp.**, Pliocene (p. 312, pl. C xi): Algeria; POMEL (175). The genus maintained, with first living representative, *A. pallaryi*, **n. sp.**, G. of Oran, Algeria; GAUTHIER (76) Bull. Soc. geol. France (3), xxv, p. 840, pl. xxiv; see also PALLARY (168). †*A. sahelienensis*, **n. sp.**, Sahelian (p. 313, pl. C xi), †*A. welschii*, **n. sp.**, Helvetian (p. 315): Algeria; POMEL (175).
- †*Archaeocidaris*:—*A. urei*, with plates and spines in position; NEILSON (159) p. 77 and fig. 3. *A. n. sp.* sine nom.; SOREIL (200) p. lxxix. *A. sp.*; BAIN (11) p. 275, 280 & 281. *A. sp.*, Carboniferous and Permo-Carboniferous, Artinsk beds, Kama basin, Russia; STUCKENBERG (204) p. 231, 271, 343, 354, pl. v, f. 22 a, b.
- †*Asterostoma*:—*A. cubense* (p. 67, pl. xxi), *A. excentricum* (p. 65, pl. xx), *A. jimeno* (p. 69, pl. xxii): Cuba; EGOZCUE (55).
- Asthenosoma hystrix*, well-developed Stewart's organs; KOEHLER (117) p. 9.
- †*Astrodapsis*:—*A. tumidus* and *A. whitneyi*; MERRIAM (151).
- †*Breynia cubensis*, Cuba; EGOZCUE (55) p. 87, pl. xxv.
- Brissaster*, subgenus of *Schizaster*, discussed; POMEL (175) p. 69.
- †*Brissoma* Ag. discussed and maintained (p. 41), *B. latipetalum* (also as *Brissopsis*), **n. sp.**, Sahelian (p. 45, pl. A vi), *B. milianense* (also as *Brissopsis*), **n. sp.**, Cartennian (p. 43, pl. A viii), *B. rocardi* (also as *Brissopsis ovatus*), **n. sp.**, Sahelian (p. 46, pl. A v), *B. sahelien* (also as *Brissopsis*), **n. sp.**, Sahelian (p. 44, pl. A v), *B. speciosum* (also as *Toxobrissus*), **n. sp.**, Sahelian (p. 47, pl. A viii), *B. tuberculatum* (also as *Brissopsis*), **n. sp.**, Pliocene (p. 48, pl. A vi): Algeria; POMEL (175).
- †*Brissomorpha welschii*, **n. sp.**, Helvetian, Algeria; POMEL (175) p. 27, pl. A xxi & xxii.
- †*Brissopatagus*:—*B. beyrichi* referred to *Euspatangus*, & *B. caumonti* discussed, (p. 154), *B. damesi*, **n. sp.**, Middle Eocene, N. of S. Floriano in Valpolicella, Venetia, "*Pericormus*-ähnlich Spatangid mit den Stachelwarzen der echten Spatangen" (p. 152, pl. iii); OPPENHEIM (163) Zeitschr. Deutsch. geol. Ges. 1.

- †*Brissopneustes aturensis*, **n. sp.**, Garumnian of Landes; ARNAUD (10) Act. Soc. Bordeaux, liii, p. 111, pl. ii. LAMBERT in Review says this is not *Brissopneustes* but "un *Micraster* à trois pores génitaux."
- †*Brissopsis boutyi*, **n. sp.**, Helvetian, Algeria; POMEL (175) p. 53, pl. A xxiv. *B. columbaris*, **n. sp.**, 511–1793 fms., various stations in G. of Panama; AGASSIZ (2) Bull. Mus. Harvard, xxxii, p. 82. †*B. delagei*, **n. sp.**, Cartennian (p. 56, pl. A xxiv), †*B. depressa* (also as *Toxobrissus*), **n. sp.**, Sahelian (p. 52, pls. A vi & viii), †*B. incerta*, **n. sp.**, Sahelian (p. 58, pl. A xxiv): Algeria; POMEL (175). †*B. jimenoi*, Cuba; EGOZCUE (55) p. 79, pl. xxiv. †*B. lata* (also as *Toxobrissus*), **n. sp.**, Sahelian, Algeria; POMEL (175) p. 50, pl. A vii. *B. lyrifera*; KOEHLER (117) p. 24. †*B. nicaisii*, **n. sp.**, based on *Eupatagus elongatus* Nic. non Agass., Helvetian (p. 54, pl. A xxiv), †*B. oranensis* (also as *Toxobrissus*), **n. sp.**, Sahelian (p. 57, pls. A vii & xxiv): Algeria; POMEL (175). †*B. ottangensis*; SCHAFFER (193) p. 535. †*B. pasqualii*, **n. sp.**, Londinian, 1, b, Ramaga near Edfu, Egypt; MAYER-EYMAR (147) Vierteljahrschr. Ges. Zurich, xliii, p. 52, pl. v. †*B. pouyannei* (also as *Toxobrissus oblongus*), **n. sp.**, Sahelian (p. 51, pls. A vi & vii), †*B. tissoti*, **n. sp.**, Helvetian (p. 55, pl. A xxiv): Algérie; POMEL (175).
- †*Brissus columbaris*, Cuba; EGOZCUE (55) p. 77, pl. xxvi. †*B. gouvini*, **n. sp.**, Pliocene, Algeria; POMEL (175) p. 39, pl. A xxiii. *B. unicolor*; CLARK (34) p. 413; CLARK (35); PALLARY (168).
- Bunactis*, section of *Clypeaster*; POMEL (175) p. 204.
- †*Caratomus londinianus*, **n. sp.**, Londinian, II, c, near Siut, Egypt; MAYER-EYMAR (147) Vierteljahrschr. Ges. Zurich, xliii, p. 50, pl. iv.
- †*Cardiaster*:—*C. ? ignabergensis*, **n. sp.**, Lower Senonian, Trümmerkalk, Ignaberga, Scania, recorded by Lundgren as *Hemipneustes*, sp. (p. 896, pl. xxxii), *C. jugatus*, compared with Scanian, supposed *Cardiaster*, spp. (p. 894, pl. xxxiii), *C. ? scania*, **n. sp.**, Senonian, "Feuerstein" in drift, Scania, formerly referred to *C. jugatus* (p. 896, pl. xxxii); SCHLUETER (194) Zeitschr. Deutsch. geol. Ges. xlix.
- †*Cassidulus australis*; TATE (205) p. 411.
- Centrostephanus longispinus*, response to shadow; UEXKÜLL (209).
- †*Cidaris australis* Duncan is a *Stereocidaris*, but the fossil usually listed under this name is *Goniocidaris*, sp.; TATE (205) p. 411. †*C. (Plegiocidaris) avenionensis*; POMEL (175) p. 321, pl. C ii. †*C. bathonica* (pp. 345, 485, 514, 576, 591), †*C. calloviensis* (pp. 563, 576, 591, 597); GIRARDOT (79). †*C. clavigera*, spines in surface drift at Mokattam; FOURTAU (65) p. 100. †*C. courtaudiana*; PETITCLERC (173) p. 125. †*C. desmoulinsi*; POMEL (175) p. 321, pl. C ii. †*C. desori*, var. *helvetica* [**var. nov.**], for Bajocian specimens; LAMBERT (128) p. 151, and PETITCLERC (173) p. 126. †*C. n. sp.*, aff. *ducreti*; GIRARDOT (79) p. 631. †*C. florigemma*; WEDD (216) pp. 602, 604, 607. †*C. forchhammeri* does not occur in Faxö, only in French pisolitic limestone; SCHLUETER (194) p. 904: is syn. of *C. tombecki* and does not occur in Danian of Scandinavia, but has been confused with *Temnocidaris danica*; HENNIG (95) p. 1. †*C. cf. guerangeri* (pp. 576, 591), †*C. koechlini* (pp. 345, 377, 401, 711, 742, 766), †*C. laeviuscula* (pp. 576, 613, 620); GIRARDOT (79). †*C. limaria*, Saharian near Cairo; MAYER-EYMAR (148) p. 72. †*C. lorteti*; GIRARDOT (79) pp. 218, 224, 232, 711. *C. (Stereocidaris) microtuberculatus*, **n. sp.** (p. 57), *C. (Porocidaridaris) misakiensis*, **n. sp.** (p. 58): Sagami Sea, Japan; YOSHIWARA (228) Annot. zool. Japon. ii. †*C. pacomei*; GIRARDOT (79) pp. 193, 218, 224, 229, 232, 277, 711. †*C. pleracanthoides*, **n. sp.**, based on spines from drift (Cretaceous) of Scania; SCHLUETER (194) Zeitschr. Deutsch. geol. Ges. xlix, p. 905, pl. xxxiii: LAMBERT in Review suggests this is deformed by boring mollusc. †*C. (Plegiocidaridaris)*

prionopleura, **n. sp.**, Sahelian, Algeria; POMEL (175) p. 322, pl. C ii. †*C. pseudopistillum*, redescribed from fresh specimens, and compared with *C. serrata*, *C. herthæ*, *C. darupensis*, *C. hanoverana*; ARNAUD (10) p. 103, pl. ii: but LAMBERT in Review says this is a *Dorocidaris*. †*C. smithi*; WEDD (216) p. 607. †*C. squamifera*, spines from Scania; SCHLUETER (194) p. 905, pl. xxxiii. †*C. spinosa*; GIRARDOT (79) p. 565. †*C. spinulosa*; PETITCLERC (173) p. 125. †*C.*, cf. *spinulosa*; GIRARDOT (79) pp. 218, 234, 240, 279, 711. *C. (Stereocidaris) tenuispinus*, **n. sp.**, Sagami Sea, Japan; YOSHIWARA (228) Annot. zool. Japon. ii, p. 57. *C. tribuloides*; CLARK (34) p. 412; CLARK (35) p. 4; KOEHLER (117) p. 8. †*C. venulosoides*, **n. sp.**, based on plates from Lower Senonian Trümmerkalk of Balsberg in Scania; SCHLUETER (194) Zeitschr. Deutsch. geol. Ges. xlix, p. 905, pl. xxxiii. †*C. cf. wrighti*; GIRARDOT (79) pp. 345, 485, 514. †*C. zschokkei*; PETITCLERC (173) p. 124; GIRARDOT (79) pp. 218, 224, 232, 254, 259, 277, 278, 283, 303, 711. †*C. sp.*, Oxfordian (?) of Schachdagh, Caucasus; SPENDIAROFF (202) p. 205. †*C. sp.*; PETITCLERC (173) p. 124. †*C. sp.*, various plates and spines from Trümmerkalk of Balsberg in Scania; SCHLUETER (194) pp. 904 & 905, pls. xxxii & xxxiii.

Cidaropsis minor; GIRARDOT (79) pp. 576, 591.

†*Clypeaster*:—*C. acclivis*, **n. sp.** (p. 210, pls. B xxi, lxii), and **n. var.**, *ponsoti* (p. 212, pl. B lxi): Cartennian, Algeria; POMEL (175). *C. acuminatus*; POMEL (175) p. 241, pl. B lxxviii. *C. ægyptiacus*=*C. pliocenicus* and is Pliocene; FOURTAU (68): **n. var.**, *punctalatus*, Helvetian, Algeria; POMEL (175) p. 236, pl. B lxxiv. *C. alticostatus* (p. 243, pl. B lxxix), *C. altus* (p. 261, pl. B xli); POMEL (175). *C. antillarum*, Cuba; EGOZCUE (55) p. 35, pl. vii. *C. atavus* (p. 172, pl. B iii), *C. atlas*, **n. sp.**, Helvetian (p. 252, pls. B xxxv & xxxvi), *C. angustatus* [? err. pro *angustatus*], **n. sp.**, Cartennian (p. 269, pl. B xxxviii), *C. badinski*, **n. sp.**, Cartennian (p. 212, pls. B lxiii & lxiv), *C. beringeri*, **n. sp.**, Helvetian (p. 199, pl. B lvii): Algeria; POMEL (175). *C. vel Echinarachnius brewerianus*; MERRIAM (151). *C. bunopetalus*, **n. sp.**, also as *C. scillæ*?, Cartennian (p. 204, pls. B xxvi, lx, lxi). *C. cartenniensis*, **n. sp.**, Cartennian (p. 246, pls. B lxxxi & lxxxii), *C. cinalaphi*, **n. sp.**, Helvetian (p. 197, pl. B lvi), *C. cælopleurus*, **n. sp.**, Helvetian (p. 266, pl. B xc), *C. collinatus*, **n. sp.**, Helvetian (p. 273, pl. B xxxiii): Algeria; POMEL (175). *C. concavus*, Cuba; EGOZCUE (55) p. 36, pl. vii. *C. confusus*, **n. sp.**, Cartennian, Algeria; POMEL (175) p. 190, pl. B xxii. *C. cotteau*, **n. sp.**, Miocene of Matanzas, Cuba; EGOZCUE (55) p. 40, pl. x. *C. crassicostatus*; POMEL (175) p. 206, pl. B xxiv. *C. cubensis*, Cuba; EGOZCUE (55) p. 33, pl. vi. *C. cultratus*, **n. sp.**, Helvetian (p. 231, pl. B lxix), *C. curtus*, **n. sp.**, Helvetian (p. 267, pl. B xxxi), *C. decemcostatus*, **n. sp.**, also as *C. conoideus* Pom. non Goldf., Helvetian (p. 235, pls. B xlvi, lxxiii), *C. delagei*, **n. sp.**, Cartennian (p. 200, pl. B lviii), *C. demaeghti*, **n. sp.**, Helvetian? (p. 225, pl. B lxx), *C. disculus*, **n. sp.**, Cartennian (p. 188, pl. B lii), *C. doma*, **n. sp.**, Helvetian (p. 223, pl. B xxxii), *C. expansus*, **n. sp.**, Helvetian (p. 182, pl. B xviii), *C. fischeuri*, **n. sp.**, Cartennian (p. 186, pl. B liii), *C. insignis*, **n. sp.**, Helvetian (p. 238, pl. B lxxv & lxxvi), *C. intermedius* (p. 202, pl. B lix), *C. laboriei*, **n. sp.**, Helvetian (p. 179, pl. B li): Algeria; POMEL (175). *C. laganoides*; PENECKE (171) p. 64. *C. lanceolatus*, **n. sp.**, ex Azpeitia MS., Miocene of Matanzas, Cuba; EGOZCUE (55) p. 39, pl. ix. *C. latus*, **n. sp.**, Helvetian (p. 219, pl. B lxvii), *C. letourneuxi*, **n. sp.**, Pliocene? (p. 232, pl. B lxxi), *C. megastoma*, **n. sp.**, Sahelian (p. 262, pl. B lxii), *C. myriophyma*, **n. sp.**, Helvetian (p. 228, pl. B xliv), *C. obeliscus*, **n. sp.**, Helvetian (p. 244, pl. B lxxx), *C. obesus*, **n. sp.**, Helvetian (p. 259, pl. B lxxxviii), *C. obtusus*, **n. sp.**,

Cartennian (p. 247, pls. B xxx, lxxxiii), *C. ogleianus*, **n. sp.**, Helvetian (p. 181, pl. B xix), *C. pachypleurus*, **n. sp.**, Helvetian (p. 270, pl. B xl), *C. paratinus*, **n. sp.**, Helvetian (p. 195, pl. B xxvii): Algeria; POMEL (175). *C. parrae*, Cuba; EGOZCUE (55) p. 31, pl. xi. *C. parvituberculatus*, **n. sp.**, Helvetian, Algeria; POMEL (175) p. 229, pl. B xlvi. *C. parvus*, near Habana, Cuba; EGOZCUE (55) p. 41, pl. xv. *C. peltarius*, **n. sp.**, horizon not given (p. 185, pl. B xx), *C. petalodes*, **n. sp.**, Cartennian (p. 250, pl. B xliii), *C. petasus*, **n. sp.**, Cartennian (p. 193, pl. B xxviii), *C. pierredoni*, **n. sp.**, Helvetian (p. 216, pl. B, lxv), *C. pileus*, **n. sp.**, Helvetian (p. 194, pl. B lv): Algeria; POMEL (175). *C. placunarius*, plain of Tor, near Sinai; FOURTAU (69) p. 18. *C. planicostatus*, **n. sp.**, Sahelian, Algeria; POMEL (175) p. 220, pl. B lxviii. *C. planipetalum*, **n. sp.**, ex Azpeitia MS., Miocene, San Lino factory, Sta. Clara, Cuba; EGOZCUE (55) p. 38, pl. viii. *C. pliocenicus*, **n. sp.**, Pliocene (p. 174, pl. B i), *C. pouyannei*, **n. sp.**, Cartennian (p. 189, pl. B liv), *C. productus*, **n. sp.**, Helvetian (p. 253, pl. B xxix), *C. productus*, **n. var. tigaudensis**, Cartennian (p. 255, pl. B lxxxv), *C. pulvinatus*, **n. sp.**, Helvetian (p. 214, pl. B xxxiv), *C. rhabdopetalus*, **n. sp.**, also as *C. crassicostatus* on Plate, Helvetian (p. 208, pls. B xxv, lx, lxii): Algeria; POMEL (175). *C. rosaceus*, concretionary limestone of Bellamar in Matanzas, Cuba; EGOZCUE (55) p. 29, pl. v. *C. scillæ*; PENECKE (171) p. 64. *C. scutellæformis*, **n. sp.**, Eocene (p. 173, pl. B xv), *C. scyphax*, **n. sp.**, Helvetian (p. 233, pl. B lxxii), *C. simoni*, **n. sp.**, Helvetian (p. 217, pl. B lxvi), *C. simus*, **n. sp.**, Sahelian (p. 176, pl. B xvi), *C. sinuatus*, **n. sp.**, Sahelian (p. 177, pl. B xvii), *C. soumatensis*, **n. sp.**, Helvetian (p. 249, pl. B lxxxiv), *C. subacutus*, **n. sp.**, Helvetian (p. 264, pls. B xlvii, lxxxix), *C. subconicus*, **n. sp.**, Sahelian (p. 256, pl. B xxxvii): Algeria; POMEL (175). *C. subdepressus*, recent; CLARK (35) p. 5. *C. subellipticus*, **n. sp.**, also as *C. ellipticus* Pom. non Munst., Helvetian (p. 271, pl. B xxxix), *C. subfolium*, **n. sp.**, Cartennian (p. 184, pl. B li, lii), *C. subhemisphaericus*, **n. sp.**, Helvetian (p. 221, pl. B lxix), *C. suboblongus*, **n. sp.**, Cartennian (p. 192, pl. B xxiii), *C. superbus*, **n. sp.**, Helvetian (p. 257, pls. B lxxxvi & lxxxvii), *C. tessellatus*, **n. sp.**, Helvetian (p. 178, pl. B xv), *C. tumidus*, **n. sp.**, Helvetian (p. 274, pl. B xci), *C. turgidus*, **n. sp.**, Cartennian (p. 226, pl. B xlv), *C. welschii*, **n. sp.**, Helvetian (p. 239, pl. B lxxvii): Algeria; POMEL (175).

+*Clypeus*:—*C. altus*; GIRARDOT (79) pp. 344, 425, 434. *C. ostervaldi*; PETITCLERC (173) p. 128. *C. ploti*; PETITCLERC (173) p. 128; GIRARDOT (79) pp. 344, 377, 390, 401, 409, 415, 485, 503; LAMBERT (128) p. 152. *C. sp. indet.*, Bathonian (?) of Alagyr, Caucasus; SPENDIAROFF (202) p. 205.

+*Codiopsis arnaudi*, Cuba; EGOZCUE (55) p. 14, pl. i.

+*Collyrites*:—*C. analis*, Bathonian of Alagyr, Caucasus, measured (p. 203): *C. cf. analis*, Callovian of Karadagh, Daghestan, measured (p. 204); SPENDIAROFF (202). *C. bicordata*; WEDD (216) p. 604. *C. elliptica*; GIRARDOT (79) pp. 576, 591, 613, 617: Callovian of Karadagh, Daghestan, measured (p. 203), *C. loewinsoni*, **n. sp.**, Oxfordian of Karadagh, Daghestan (p. 201, text-fig.), *C. cf. loryi*, Corallian of Pass Balkar-Digori, Caucasus, measured (p. 204); SPENDIAROFF (202) Beitr. Pal. Oesterr.-Ung. xi. *C. ovalis* (pp. 576, 591, 613, 617), *C. pseudoringens* (p. 591); GIRARDOT (79). *C. rostrata*, **n. sp.**, Bathonian of Alagyr, Caucasus, and *C. warwaræ*, **n. sp.**, Callovian, Pass Balkar-Digori, Caucasus, and Karadagh, Daghestan; SPENDIAROFF (202) Beitr. Pal. Oesterr.-Ung. xi, p. 200, text-figg.

+*Conoclypeus*:—*C. delanouei*, **n. var.**, *milviformis*, Eocene, Libyan series, Egypt; GREGORY (89) Geol. Mag. (n. s.) dec. iv, vol. v, p. 154, pl. vi.

- C. rostratus* Tate is a *Plesiolampas*; TATE (205) p. 412; but LAMBERT in Review says it is *Echinolampas*, non *E. rostratus* Cotteau, and proposes *E. tatei*, **nom. nov.** *C. sowerbyi*, **n. sp.**, Londinian, 1, near Esneh, Egypt; MAYER-EYMAR (147) Vierteljahrschr. Ges. Zurich, xliii. p. 48, pl. iv.
- †*Conolampas letourneuxi*, **n. sp.**, Helvetian?, Tunis, Algeria; POMEL (175) p. 161, pl. B, iii bis.
- †*Coptosoma thevestense*, Egypt; GREGORY (89) p. 152, pl. v.
- †*Cyphosoma cubense*, **n. sp.**, Cretaceous, Cienfuegos, Cuba; EGOZCUE (55) p. 12, pl. i.
- Cystechinus loveni*, **n. sp.**, 1879 fms. off Acapulco (p. 79, pl. ix), *C. rathbuni*, **n. sp.**, 1672–1823 fms. off Mariato Pt. and Malpelo Id. (p. 79, pl. x); AGASSIZ (2) Bull. Mus. Harvard, xxxii.
- †*Deakia* Pavay, referred to *Schizobrissus*; POMEL (175) p. 60.
- Dermatodiadema*, **n. g.** of *Diadematidae*, based on two **n. spp.**, viz. *D. globulosum*, 1772 fms. Mapelo Id., 1573 fms. off Galera Pt., and *D. horridum*, 902–1772 fms. near Cocos, Malpelo, and Galapagos Id., and off Galera Pt., genus probably incl. *Aspidodiadema antillarum*; AGASSIZ (2) Bull. Mus. Harvard, xxxii, p. 76, pl. v.
- †*Diadema desori*, spines probably of this species recorded from Pliocene of Italy, and compared with Dactylopores; FORNASINI (64): but their Echinoid nature proved, and species compared with *D. sahelense* and *D. calarensis*; SACCO (190) p. 73. †*D. fischeuri*, **n. sp.**, Upper Eocene (p. 319, pl. C xiv), †*D. sahelensis* [sic], **n. sp.**, Sahelian (p. 318, pl. C xii): Algeria; POMEL (175). *D. setosum*; CLARK (34) p. 412, and (35) p. 4: shelters a fish; COUTIERE (38) p. 238.
- Dialithocidaris*, **n. g.** of *Arbaciadae* with genotype *D. gemmifera*, **n. sp.**, 1793 fms., station 3382 [? off Galera Pt.], genus probably incl. *Podocidaris prionigera*; AGASSIZ (2) Bull. Mus. Harvard, xxxii, p. 75, pl. v.
- †*Discoidea decorata*, Cienfuegos, Cuba; EGOZCUE (55) p. 23, pl. xii: ?, Lower Cretaceous, Aberdeenshire, described; JUKES-BROWNE (109) p. 28.
- Dorocidaris panamensis*, **n. sp.**, 66–112 fms., off Cocos Id. and Galera Pt., G. of Panama; AGASSIZ (2) Bull. Mus. Harvard, xxxii, p. 73, pls. i & ii. *D. papillata*; KOEHLER (117) p. 8; PALLARY (168): *Echinopluteus*, redescri. after Prouho; MORTENSEN (156) p. 110, and (157) p. 78. †*D. pseudohystrix*, **n. sp.**, Pliocene (p. 326, pl. C xiv), †*D. pungens*, **n. sp.**, also as *Cidaris*, Sahelian (p. 325, pl. C ii), †*D. sahelensis*, **n. sp.**, also as *Cidaris*, Sahelian (p. 324, pl. C i), †*D. welschii*, **n. sp.**, Pliocene (p. 327, pl. C xiv): Algeria; POMEL (175).
- †*Echinanthus antillarum*, Cuba; EGOZCUE (55) p. 52, pl. xvi. †*E. badinskii*; POMEL (175) p. 121. †*E. parallelus*, **n. sp.**, ex Azpeitia MS. Eocene of Sta Lucia in Sta Clara, Cuba; EGOZCUE (55) p. 53, pl. xii. *E. rosaceus*; CLARK (35) p. 5.
- †*Echinarachnius excentricus*; MERRIAM (151). †*E. juliensis*, see *Iheringia*. †*E. vel Scutella gibbsi*; MERRIAM (151). *E. parma*; KOEHLER (117) p. 24: breeding season; BUMPUS (24) p. 855: *Echinopluteus*, redescri.; MORTENSEN (156) p. 143, and (157) p. 101. *E. tenuis*, **n. sp.**, Kominato in Awa, Japan; YOSHIWARA (228) Annot. zool. Japon. ii, p. 61.
- †*Echinobrissus*:—*E. australis* Duncan is a *Cassidulus*; TATE (205) p. 411. *E. clunicularis*; GIRARDOT (79) pp. 344, 377, 415, 485, 514, 576, 591, 597; PETITCLERC (173) p. 130: Bathonian of Alagyr, Caucasus; SPENDIAROFF (202) p. 205: apex of specimen from Comberjon; LAMBERT (128) p. 149, fig. 4. *E. scutatus*; WEDD (216) pp. 602, 604, 607. *E. terquemi*; GIRARDOT (79) pp. 344, 377, 407.
- Echinocardium australe*, cast up on New Brighton beach, N. Z.; DENDY (46) p. 323. *E. cordatum*; PALLARY (168); LÖNNBERG (134) p. 48: Mediterranean form; KOEHLER (120): individual variations; MARION

- (146) p. 166: hybrid larvæ; VERNON (214): *Echinopluteus*, redescri.; MORTENSEN (156) p. 146, pl. iv, and (157) p. 102, pl. ix. *E. mediterraneum*, hybrid larvæ; VERNON (214). †*E. nummuliticum*; POMEL (175) p. 8. *E. pennatifidum*, sciagram; WOLFENDEN (227) pl. xii: at Tamaris-sur-Mer (Var); KOEHLER (120): description, compared with *E. cordatum* and *E. flavescens*, incl. *Amphidetus gibbosus* Barrett non Ag.; KOEHLER (117) p. 24, pls. iii, iv, viii.
- †*Echinoconus*:—*E. abbreviatus* and *E. albogalerus*; SIEGERT (197) p. 95. *E. albogalerus*, in surface drift at Mokattam; FOURTAU (65) p. 100. *E. antillensis*, Cuba; EGOZCUE (55) p. 21, pl. iii. *E. castanea*, Lower Cretaceous, Aberdeenshire, doubtful; JUKES-BROWNE (109) p. 28. *E. lanieri*, Cuba; EGOZCUE (55) p. 19, pl. ii. *E. subrotundus*; ANASTASIU (6). *E. vulgaris*; SIEGERT (197) p. 95.
- †*Echinocorys*:—*E. carinatus* with 9 genital pores, enlarged fig.; JANET (106) p. 7, fig. 1. *E. vulgaris*, from Caucasus; KARAKASCH (103) p. 175, pl. vii. See also *Ananchytes*.
- Echinocrepis setigera*, n. sp., 1573–1879 fms., off Galera Pt. and Acapulco; AGASSIZ (2) Bull. Mus. Harvard, xxxii, p. 78, pl. xiii.
- †*Echinocyamus declivis*, n. sp., Cartennian (p. 289, pl. B x), †*E. pliocenicus*, n. sp., Pliocene (p. 292, pl. B xiv): Algeria; POMEL (175). *E. pusillus*; MARION (146) p. 166; LÖNNBERG (134) p. 47; PALLARY (168); KOEHLER (117) p. 24: *Echinopluteus*, redescri., nerve-system; MORTENSEN (156) p. 139, text-fig. 12, pl. iv and (157) p. 98, pl. ix, text-fig. 12. †*E. strictus*, n. sp., Sahelian (p. 291, pl. B x), †*E. tarentinus*? (p. 293, pl. B x), †*E. umbonatus*, n. sp., Sahelian (p. 290, pl. B x): Algeria; POMEL (175).
- †*Echinocyphus difficilis*, Lower Cretaceous, Aberdeenshire; JUKES-BROWNE (109) p. 30.
- †*Echinolampas*:—*E. abbreviatus* [sic], n. sp., also as *E. curtus* Pom. non Agass., Cartennian, Algeria; POMEL (175) p. 138, pl. B ix. *E. africanus*, near Sinai; FOURTAU (69) p. 16. *E. algirus*, n. sp., Pliocene, Algeria; POMEL (175) p. 158, pl. B, v. *E. amplus* (p. 157), *E. amygdala*, measurements (p. 156); GREGORY (89). *E. amygdalina*, n. sp., Londinian, I, b, & II, c, near Esneh and Siut, Egypt; MAYER-EYMAR (147), Vierteljahrschr. Ges. Zurich, xliii, p. 49, pl. iii. *E. beaumonti* discussed; OPPENHEIM (163) p. 162. *E. cartenniensis*, n. sp., also as *E. manzonii*, based on *E. depressus* Manz. non Gray, Cartennian, Algeria; POMEL (175) p. 136, pl. B viii. *E. castroi*, Cuba; EGOZCUE (55) p. 57, pl. iii. *E. chelone*, n. sp., Helvetian (p. 157, pl. B vi bis), *E. claudus* n. sp., Cartennian (p. 145, pl. B viii): Algeria; POMEL (175). *E. clevei*, Cuba; EGOZCUE (55) p. 61, pl. xix. *E. clypeolus*, n. sp., also as *E. subangulatus* Pom. non Herklotz, Eocene (p. 151, pl. B v), *E. costatus*, n. sp., based on *E. hayesianus* Nic. non Desor, Helvetian (p. 140, pl. B viii bis): Algeria; POMEL (175). *E. crameri*; FOURTAU (66) p. 84. *E. duncani*, nom. nov. pro *E. obesus* Dunc. & Slad. non Bittner (p. 167), *E. eberti*, n. sp., Upper Oligocene, Doberg bei Bünde, Germany (p. 150, pl. ii); OPPENHEIM (163) Zeitschr. Deutsch. geol. Ges. I. *E. flexuosus*, n. sp., Cartennian (p. 146, pl. B ix); *E. floescens* (p. 128) n. var. *avellana* (p. 131), n. var. *coarctatus* (p. 130), n. var. *maresii* (p. 131), n. var. *subpyguroides* (p. 130): Algeria; POMEL (175). *E. globulus*; GREGORY (89) p. 156. *E. hayesianus* (p. 144, pl. B ix), *E. icosiensis*, n. sp., Cartennian (p. 149, pl. B vi bis), *E. inæqualis*, n. sp., Cartennian (p. 137, pl. B viii), *E. insignis*, n. sp., Helvetian (p. 153, pl. B v), *E. jubæ*, first figd. as n. sp., then made syn. of *E. algirus* (p. 160, pl. B iv): Algeria; POMEL (175). *E. lepsiusi*, n. sp., Lower or Middle Eocene, Romallo in S. W. Tirol, and Dos Trentos near Trient; OPPENHEIM (163) Zeitschr. Deutsch. geol. Ges. I, p. 158, pl. iii. *E. libycus*, measurements; GREGORY (89) p. 156.

- E. lycopersicus*, Cuba; EGOZCUE (55) p. 59, pl. xix. *E. mazzettii*, n. sp., Miocene, Sambuci, Italy; ANGELIS D' OSSAT (9) p. 293, text-fig. *E. minichensis*, n. sp., Londinian, II, c, Minieh, Egypt; MAYER-EYMAR (147) Vierteljahrschr. Ges. Zurich, xliii, p. 49, pl. iv. *E. monteiralensis* discussed; OPPENHEIM (163) p. 164. *E. nicaisii*; POMEL (175) p. 135. *E. ovum-serpentis*, Cuba; EGOZCUE (55) p. 62, pl. xvi. *E. perrieri*, measurements, Mokattam series, Egypt; GREGORY (89) p. 156. *E. politus* Desm. includes two forms—varr. or spp.; *E. cf. politus*, Middle Eocene, Venetia, had the author regarded it as n. sp. he would have called it *E. vitifer*; OPPENHEIM (163) Zeitschr. Deutsch. geol. Ges. I, p. 161 & fig. *E. polygonus*, n. sp., Cartennian?, Algeria; POMEL (175) p. 139, pl. B, viii bis. *E. præcedens*, n. sp., Londinian, I, b, near Esneh, Egypt; MAYER-EYMAR (147) Vierteljahrschr. Ges. Zurich, xliii, p. 49, pl. iv. *E. pyguroides*, n. sp., Cartennian (p. 152, pl. B vi), *E. raymondi*, n. sp., based on *E. hayesianus* Wright & Cott. non Desor, Helvetian (p. 142, pl. B vii bis): Algeria; POMEL (175). *E. semiorbis*, Cuba; EGOZCUE (55) p. 53, pl. xvii. *E. soumatensis*, n. sp. (p. 148, pl. B, ix), *E. subhemisphæricus*, n. sp. (p. 155, pl. B vii bis): Helvetian, Algeria; POMEL (175). *E. suessi*, discussed; OPPENHEIM (163) p. 159. *E. sulcatus*, incl. ? *E. escheri* Nic. non Agass.; POMEL (175) p. 133. *E. tatei*, nom. nov. pro *E. (olim Conoclypeus et Plesiolampas) rostratus* Tate non Cotteau; LAMBERT in Review of TATE (205). *E. tumidopetalum*, n. sp., Miocene, Egypt; GREGORY (89) Geol. Mag. (n. s.) dec. iv, vol. v, p. 155, pl. vi.
- Echinometra subangularis*; CLARK (34) p. 412, and (35) p. 4; IHERING (102) p. 155. *E. viridis*; CLARK (35) p. 4.
- +*Echinoneus cyclostomus* and +*E. orbicularis*, Cuba; EGOZCUE (55) p. 47, pl. xv. *E. semilunaris*; CLARK (34) p. 412, and (35) p. 5.
- +*Echinopedina cubensis*, Cuba; EGOZCUE (55) p. 16, pl. ii.
- Echinopluteus coronatus*, n. sp., Kattegat; (156) p. 136, pl. iv, and (157) p. 96, pl. ix; *E. fusus*, n. sp., Messina, redescrib. from Müller; (156) p. 148, and (157) p. 104, text-fig. 13; *E. mülleri*, n. sp., Messina, probably of *Centrostephanus longispinus*; (156) p. 112, and (157) p. 79; *E. solidus*, n. sp., Messina, redescrib. from Müller; (156) p. 150, and (157) p. 105; *E. theelii*, n. sp., Kattegat and ? North Sea, of *Echinus* sp. p. 137, ?pl. iv, and (157) p. 97, pl. ix: MORTENSEN (156).
- +*Echinospatagus*:—*E. (Echinocardium) algirus*, n. sp., Pliocene (p. 6, pl. A xvii), *E. cordiformis* (p. 4, pl. A xvii): Algeria; POMEL (175). *E. cordiformis* from Caucasus; KARAKASCH (103) p. 174. *E. mauritanicus*, n. sp., Pliocene, Algeria; POMEL (175) p. 5, pl. A xvii.
- Echinostrephus pentagonus*, n. sp., Bonin Is., Japan; YOSHIWARA (228) Annot. zool. Japon. ii, p. 59.
- Echinus acutus*; PALLARY (168); KOEHLER (117) p. 23: hybrid larvæ; VERNON (214): *Echinopluteus*; MORTENSEN (156) p. 132, and (157) p. 93. +*E. algirus*, n. sp. (p. 309, pl. C viii), +*E. durandoi*, n. sp. (p. 310, pl. C ix): Pliocene, Algeria; POMEL (175). *E. esculentus*, sciagram; WOLFENDEN (227) pl. xiii: 4-rayed; CHADWICK (31): dissection; KÜKENTHAL (123) p. 120: *Echinopluteus*, = "Helgoländsche Seeigellarve" of Müller, redescrib.; MORTENSEN (156) p. 134, and (157) p. 94. +*E. etheridgei*, n. sp., Pliocene shell beds of St. Erth, Cornwall, based on plates and spines in Mus. geol. Soc. Cornwall; BELL (18) p. 165, pl. iii, fig. 15. *E. melo*; PALLARY (168): ?*Echinopluteus*, redescrib.; MORTENSEN (156) p. 135, and (157) p. 96. *E. microtuberculatus*, segmentation of ovum; ZIEGLER (230): larva affected by various chemicals; HERBST (96): hybrid larvæ; VERNON (214), and DRIESCH (54): *Echinopluteus*, redescrib.; MORTENSEN (156) p. 130, and (157) p. 92. *E. miliaris*, *Echinopluteus*; MORTENSEN (156) p. 131, pl. iv, and (157) p. 93, pl. viii. *E. multicolor*, n. sp., Akune in Satsuma, Japan;

- YOSHIWARA (228) Annot. zool. Japon. ii, p. 60. *E. sphaera*; KOEHLER (117) p. 23.
- †*Enallaster*:—*E. scoticus*, Lower Cretaceous, Aberdeenshire; JUKES-BROWNE (109) p. 30. *E. tschudii*; DOUVILLÉ (51).
- †*Encope cia*, Cuba; EGOZCUE (55) p. 44, pl. xiii. *E. emarginata*, local name "corrupio"; IHERING (102) p. 155.
- †*Eocidaris? keyserlingi*, redescri., differences from account by Kolesch, no apparent difference from *Archæocidaris ladina* Stache; SPANDEL (201) p. 33, pl. xiii: see next entry.
- †*Eotiaris* n. g. pro *Cidaris keyserlingi* Geinitz; LAMBERT in Review of SPANDEL (201) Rev. crit. Pal. iii, p. 82, footnote.
- †*Euechinolampas*, section of *Echinolampas*; POMEL (175) p. 128.
- †*Eupatagus*:—*E. cotteawi*; GREGORY (89) p. 157. *E. cruciatus*, incl. *E. subrostratus* et *hagenmulleri* Per. & Gauth.; POMEL (175) p. 10. *E. decipiens* Tate, transferred to *macropneustes* "on the authority of Dr A. C. [?J. W.] Gregory"; TATE (205) p. 412. *E. libycus*; GREGORY (89) p. 157.
- †*Euspatangus cairensis*; FOURTAU (66) p. 84.
- Fibularia acuta*, n. sp., Misaki and Shigajima, Japan; YOSHIWARA (228) Annot. zool. Japon. ii, p. 60.
- †*Galeropygus*:—*G. agariciformis*; PETITCLERC (173) p. 127: Bajocian, Haute-Saône; LAMBERT (128) p. 143. *G. jolyi*, n. sp., Middle Cenomanian of Angoulême; GAUTHIER (76) Bull. Soc. geol. France (3), xxv, p. 836, text-fig. *G. marcoui*; PETITCLERC (173) p. 127. *G. nodoti*; GIRARDOT (79) pp. 344, 377, 391, 401. *G. cf. sulcatus*; PETITCLERC (173) p. 127: "cinquième costale [genital] imperforée en contact avec le périprocte"; LAMBERT (128) p. 144, fig. 1.
- Goniocidaris canaliculata*, distribution; PRATT (178) p. 17. *G. doederleini*, n. sp., 52 fms., off Cocos Id., G. of Panama; AGASSIZ (2) Bull. Mus. Harvard, xxxii, p. 73, pl. iii. †*G. sp.*; TATE (205), p. 411.
- †*Gualteria orbigny*; ENGERRAND (57).
- †*Guetteria danglesi*, n. sp., Senonian?, Hadjadja in Mascara, Algeria; GAUTHIER (76) Bull. Soc. geol. France (3), xxv, p. 831, pl. xxiv.
- †*Haimea delagei*, redescri., see also *Pseudohaimea*, Algeria; POMEL (175) p. 116, pl. B ix bis).
- †*Hemiaster*:—*H. antillensis* (p. 72, pl. xxiv). *H. cubensis* (p. 73, pl. xxv), Cuba; EGOZCUE (55). *H. cubicus*, near Sinai; FOURTAU (69) pp. 11, 13. *H. dewalquei*, Cuba; EGOZCUE (55) p. 75, pl. iii. *H. (Periaster) fourtaui*, n. sp., Parisian, I, e, Mokattam, Egypt; MAYER-EYMAR (147) Vierteljahrschr. Ges. Zurich, xliii, p. 52, pl. 5. *H. heberti*, near Sinai; FOURTAU (69) pp. 9, 13. *H. leymerii*; ANASTASIU (6). *H. (Periaster) nubicus*, n. sp., Suessonian, I, between Assouan and Kurkur, Egypt; MAYER-EYMAR (147) Vierteljahrschr. Ges. Zurich, xliii, p. 52, pl. vi. *H. schweinfurthi*; GREGORY (89) p. 158. *H. tamulicus* is allied to *H. prunella*, genotype of *Bolbaster* Pomel, and to *H. stella*; LAMBERT in Review of KOSSMAT. *H. wilcocksii*, n. sp., Londinian, I, b, near Esneh, Egypt; MAYER-EYMAR (147) Vierteljahrschr. Ges. Zurich, xliii, p. 51, pl. v.
- †*Hemicidaris*:—*H. crenularis*, at St. Clement-lès-Macon, figured; LISSAJOUS (131). *H. cf. guerangeri* (pp. 576, 591), *H. cf. jauberti* (pp. 345, 377, 391, 401), *H. langrunensis* (pp. 345, 509, 514), *H. luciensis* (pp. 345, 509, 514); GIRARDOT (79).
- †*Hemigymnia*, n. g., genotype *H. aturica*, n. sp., Lower Garumnian of Rivière (Landes); ARNAUD (10) Act. Soc. Bordeaux, liii, p. 118, pl. ii.
- †*Hemipatagus fischeuri*, n. sp., Cartennian, Algeria; POMEL (175) p. 26, pl. A, xxiii.
- †*Hemipedinia chalmasi*; PETITCLERC (173) p. 129; LAMBERT (128) p. 153.
- †*Hemipneustes* sp. Trümmerkalk of Scania, referred provisionally to *Cardiaster*, as *C. ignabergensis*, n. sp.; SCHLUETER (194) p. 889.

Hipponoe esculenta; CLARK (34) p. 412, and (35) p. 5.

†*Holaster*:—*H. altus*, from Wilmington, species incl. *H. bischoffi*; JUKES-BROWNE (108) pp. 246–250, and pl. xxiv. *H. faxensis*, **n. sp.**, ex museum name, Danian of Annetorp in Scania, also Faxe on Seeland; HENNIG (95) Bih. Svenska Ak. xxiv, Afd. iv, No. 2, p. 6, pl.-fig. 1–5: views of Desor and Fischer-Benzon controverted; SCHLUETER (194) p. 898. *H. subglobosus*, relations to *H. altus* and *H. bischoffi*; JUKES-BROWNE (108) p. 248.

†*Holactypus*:—*H. cenomanensis*, near Sinai; FOURTAU (69) p. 13. *H. depressus*; WEDD (216) pp. 602, 604: GIRARDOT (79) pp. 344, 377, 415, 485, 505, 562, 576, 591, 613, 617, 620. *H. cf. depressus*, Callovian, Caucasus; SPENDIAROFF (202) p. 205. *H. hemisphericus*; GIRARDOT (79) p. 344. *H. macropygus* from Caucasus; KARAKASCH (103) p. 173, pl. iii (not iv as quoted in text). *H. cf. orificatus*, Oxfordian?, Caucasus; SPENDIAROFF (202) p. 205. *H. punctulatus*; GIRARDOT (79), pp. 576, 591, 613, 617.

Homolampas hastata, **n. sp.**, 976–1132 fms., near Cocos and Malpelo Is.; AGASSIZ (2) Bull. Mus. Harvard, xxxii, p. 81, pl. xi.

†*Hyboclypus*:—*H. gibberulus*; WEDD (216) pp. 604, 618. *H. subcircularis*; PETITCLERC (173) p. 128: apex described and compared with *H. theobaldi*; LAMBERT (128) p. 145, figg. 2, 3.

†*Hypsoclypus*:—*H. doma*, **n. sp.**, Cartennian (p. 163, pls. B ii, ii bis & iii), *H. latus*, **n. sp.**, Sahelian (p. 167, pls. B i & iii), *H. oranensis*, **n. sp.**, Sahelian (p. 168, pl. B iv), *H. ponsoti*, **n. sp.**, Helvetian (p. 166, pl. B iii), *H. pouyaneï* [sic], **n. sp.**, ex Delage MS., Pliocene (p. 169, pl. B iii): Algeria; POMEL (175).

†*Hypsopatagus*:—*H.?* *lefebvrei*, Assiut, Egypt; GREGORY (89) p. 157. *H.*, **sp.**, Egypt; GREGORY (89) p. 157, pl. vi.

†*Iheringia*, **n. g.** of Scutellidæ, based on *Scutella patagonensis* Desor and including *Echinarachnius juliensis*, fully described, measured, and figd., and relations to other genera discussed; LAHILLE (126) Revist. Mus. La Plata, viii, p. 437, pls. i & ii.

Laganidea section of *Clypeaster*; POMEL (175) p. 172.

†*Laganum depressum*, var. aff. *attenuatum*, Egypt; GREGORY (89) p. 153.

†*L. elongatum*, **n. sp.**, Miocene of Matanzas, Cuba; EGOZCUE (55) p. 26, pl. iv. *L. rostratum*, New Zealand **sp.** so referred is probably *L. decagonale*; FARQUHAR (61) p. 302. †*L. sinaiticum*, plain of Tor, near Sinai; FOURTAU (69) p. 18.

†*Linthia*:—*L. aschersoni*; GREGORY (89) p. 158. *L. bathyolcos* Dames *pars*, syn. of *L. orbigny*; OPPENHEIM (163) p. 157. *L. cavernosa*; *L. (?) cotteavi*, measurements, allied to *Schizaster*, Libyan series, Egypt; *L. delanouei*, measurements; GREGORY (89) p. 159. *L. esnehensis-aschersoni*, intermediate form; GREGORY (89) p. 158, pl. vi. *L. hessi*, **n. sp.**, Parisian, II, a, near Mokattam, Egypt; MAYER-EYMAR (147) Vierteljahrschr. Ges. Zurich, xliii, p. 53, pl. vi. *L. pulcinella*, **n. sp.**, Middle Eocene, N. of S. Floriano in Valpolicella, Venetia, allied to *L. scarabæus*; OPPENHEIM (163) Zeitschr. Deutsch. geol. Ges. I, p. 155, pl. ii.

†*Lonchophorus* Dames, rejected; POMEL (175) p. 21.

†*Macropneustes* Ag. discussed and restr. (p. 37), *M. abruptus* (p. 38); POMEL (175). *M. antillanus* (p. 95, pl. xxix), *M. clevei* (p. 93, pl. xxviii), *M. cubensis* (p. 91, pl. xxiii), Cuba; EGOZCUE (55). *M. decipiens*; TATE (205) p. 412. *M. elongatus*; POMEL (175) p. 38. *M. minor*; CANU (48) Zool. Rec. 1897 [omitted]. *M. schweinfurthi*, **n. sp.**, Parisian, I, d, Moeleh Oasis (p. 54, pl. vi), *M. sickenbergeri*, **n. sp.**, Londinian, I, b (p. 55, pl. iii), *M. similis*, **n. sp.**, Londinian, I, b, near Esneh (p. 55, pl. vi): Egypt; MAYER-EYMAR (147) Vierteljahrschr. Ges. Zurich, xliii.

- +*Maretia* Gray = *Hemipatagus* q. v.; POMEL (175) p. 25.
Mellita sexforis; CLARK (34) p. 412, and (35) p. 5. *M. testudinata*; IHERING (102), p. 155; CLARK (35) p. 5.
Meoma ventricosa, two varieties from Kingston and Port Antonio respectively; CLARK (35) p. 5.
Mespilia levituberculatus, **n. sp.**, Sagami Sea and other locc., Japan; YOSHIWARA (228) Annot. zool. Japon. ii, p. 58.
+*Micraster* (*Epiaster*) *ultimus*, **n. sp.**, Suessonian I, El Karah near Assouan, Egypt; MAYER-EYMAR (147) Vierteljahrsch. Ges. Zurich, xliii, p. 51, pl. vi.
+*Micropsis mokattanensis* [sic]; FOURTAU (65) p. 99.
Miophyma, section of *Clypeaster*; POMEL (175) p. 260.
Moiria, subgenus of *Schizaster*, discussed; POMEL (175) pp. 68, 69.
Nina, subgenus of *Schizaster*, discussed; POMEL (175) pp. 68, 69, 87.
+*Nucleolites avellana*, **n. sp.**, Parisian. I, b, Minieh, Egypt; MAYER-EYMAR (147) Vierteljahrschr. Ges. Zurich, xliii, p. 50, pl. iv.
+*Oligophyma*, **n. g.** (p. 307), *O. cellense*, **n. sp.**, Helvetian (p. 307, pl. C x), *O. oranense*, **n. sp.**, Sahelian (p. 308, pl. C x): Algeria; POMEL (175).
+*Opissaster*:—*O. declivis*, **n. sp.**, Pliocene (p. 107, pl. A ix), *O. insignis*, **n. sp.**, Helvetian (p. 105, pl. A xxx), *O. polygonalis*, **n. sp.**, Sahelian (p. 106, pl. A ix): Algeria; POMEL (175).
Ova, subgenus of *Schizaster*, discussed; POMEL (175) pp. 67–70.
Oxypleura, section of *Clypeaster*; POMEL (175) p. 221.
+*Palaechinus*:—*P. paradoxus*, Carboniferous, Kama basin, Russia; STUCKENBERG (204) pp. 231, 343. *P.*, **n. spp.**, sine nomm.; SOREIL (200) p. lxxix. *P. sp.* Permocarboniferous, Artinsk beds, Kama basin, Russia; STUCKENBERG (204) pp. 270, 354, pl. v, fig. 21, a, b.
+*Palaeodiadema*, **n. s.-g.**, with type *Pseudodiadema fragile* Wiltsh.; POMEL (175) p. 318.
Palaeotropus hironellei, detailed description; KOEHLER (117) p. 29, pls. v, vi, ix.
Paratina, section of *Clypeaster*; POMEL (175) p. 190.
+*Pedina inflata*, second specimen known; GREPPIN (90) p. 10.
Periaster tenuis, **n. sp.**, 1573–1772 fms. off Galera Pt.; AGASSIZ (2) Bull. Mus. Harvard, xxxii, p. 82, pl. xi.
+*Peribrissus*, **n. g.** with genotype *P. sahelensis*, **n. sp.**, Sahelian, Algeria; POMEL (175) p. 63, pl. A iv.
+*Pericosmus*:—*P. ? blankenhorni*, **n. sp.**, Mid. Eocene of Aintab, Syria, apparently 4 genital pores, compared with *P. monteivalensis* and *Periaster capellinii*; OPPENHEIM in KINKELIN (115) p. 163, figg. 5 a–d. *P. ficheuri*, **n. sp.** (p. 113, pl. A xxx), *P. icosii*, **n. sp.** (p. 114, pl. A xxx): Cartennian, Algeria; POMEL (175). *P. latus*, Egypt; GREGORY (89) p. 158: Miocene, Sambuci, Italy; ANGELIS D'OSSAT (9) p. 293. *Pericosmus monteivalensis* has three genital pores, not four as Dames said, and probably does not include *Periaster capellinii*, it is not Eocene as Cotteau said, but never occurs below Schioschichten, which are Upper Oligocene or Lower Miocene; OPPENHEIM in KINKELIN (115) pp. 165, 166. *P. nicaissii*; POMEL (175) p. 111. *P. peroni*, Egypt; GREGORY (89) p. 158. *P. subaequipetalus*, ? incl. *Linthia bisulca* Gauth.; POMEL (175) p. 112.
Phormosoma hispidum, **n. sp.**, Pacific generally [no depth or locality given] (p. 77, pls. vi & vii), *P. panamensis*, **n. sp.**, 1825 fms., Malpelo Id., perh. a **n. g.** (p. 77); AGASSIZ (2) Bull. Mus. Harvard, xxxii. *P. uranus* = "*P. luculentum* Ag." of Koehler (78, 79) Zool. Rec. 1895, detailed description, intestinal siphon, Stewart's organs, neanic individuals, parasitic Copepod; KOEHLER (117) pp. 10, 20, pls. i, iii, ix.
Phrissocystis **n. g.** of *Ananchitidae*, based on *P. aculeata*, **n. sp.**, 1067 fms.

- Station 3366 [?near Cocos Id.] ; AGASSIZ (2) Bull. Mus. Harvard, xxxii, p. 80, pl. xii.
- †*Plagiobrissus pomeli* Delage, redescr. fr. Pliocene, Algeria; POMEL (175) p. 34, pl. A xxii.
- †*Plagionotus* Ag. nom. preocc., revived as *Plagiobrissus*; POMEL (175) p. 34. *Platypleura*, section of *Clypeaster*; POMEL (175) p. 174.
- Plesianthus ogasawaraensis*, n. sp., Bonin Is., Japan; YOSHIWARA (228) Annot. zool. Japon. ii, p. 60.
- †*Plesiolampas*:—*P. delagei*, n. sp., olim *P. gauthieri* Pomel non Cott. (p. 123, pl. B ix bis), *P. ficheuri*, n. sp. (p. 124, pl. B ix bis): Cartennian, Algeria; POMEL (175). *P. rostratus*; TATE (205) p. 412; but see *Echinolampas tatei*. *P. welschii*, n. sp., Helvetian, Algeria; POMEL (175) p. 125, pl. B ix bis.
- Plexechinus* n. g. allied to *Pourtalesia* and based on *P. cinctus*, n. sp., 676 fms., Tres Marias, G. of California; AGASSIZ (2) Bull. Mus. Harvard, xxxii, p. 78, pl. viii.
- Pliophyma*, section of *Clypeaster*; POMEL (175) p. 247.
- Podocidaris prionigera*, doubtfully referred to *Dialithocidaris*; AGASSIZ (2) p. 75.
- Porocidaris cobosi*, n. sp., 385 fms., off Chatham Id. (p. 74, pl. iii), *P. milleri*, n. sp., 465–1879 fms., off C. Mala, Malpelo Id., Galera Pt., and Acapulco (p. 74, pl. iv); AGASSIZ (2) Bull. Mus. Harvard, xxxii.
- Pourtalesia tanneri*, n. sp., 995–1189 fms., Galapagos Is. and G. of California; AGASSIZ (2) Bull. Mus. Harvard, xxxii, p. 77, pl. viii.
- †*Psammechinus duciei*, Helvetian, Egypt; GREGORY (89) p. 151, pl. v: but LAMBERT in Review refers this to *Schizechinus*. †*P. levior*, n. sp., Sahelian, Algeria; POMEL (175) p. 311, pl. C xii. †*P. lyonsi*, n. sp., Helvetian, Egypt; GREGORY (89) Geol. Mag. (n. s.) dec iv, vol. v, p. 151, pl. v: but LAMBERT in Review refers this to neighbourhood of *Anapesus* as type of n. g. *Taxophyma*. *P. microtuberculatus*; MARION (146) p. 172. *P. miliaris*; KOEHLER (117) p. 24; GADEAU DE KERVILLE (74) p. 340. †*P. mirabilis*, Saharian near Cairo; MAYER-EYMAR (148) p. 72. †*P. subrugosus*, n. sp., Sahelian, Algeria; POMEL (175) p. 310, pl. C xii.
- †*Pseudocidaris* sp.; GIRARDOT (79) pp. 345, 514.
- †*Pseudodiadema*:—*P. bourgueti*, from Caucasus; KARAKASCH (103) p. 172, pl. iii. *P. calloviense*; GIRARDOT (79) pp. 576, 591, 597. *P. depressum*; PETITCLERC (173) p. 129. *P. subcomplanatum* (pp. 345, 377, 415), *P. superbum* (p. 631); GIRARDOT (79). *P.* sp.; PETITCLERC (173) p. 129.
- †*Pseudohaimea*, n. g., doubtfully suggested for *Haimea delagei* and *Amblypygus melitensis*; POMEL (175) p. 118.
- †*Pseudopygaulus*:—*P. buccalis* (p. 119), *P. maresii* (p. 120), *P. trigeri* (p. 119); POMEL (175).
- †*Pygaster*:—*P. laganoides*; GIRARDOT (79) pp. 344, 377, 391, 401, 415. *P. trigeri*; PETITCLERC (173) p. 129; LAMBERT (128) p. 153. *P.* cf. *trigeri*; GIRARDOT (79) pp. 344, 425, 434, 441, 455, 576, 591. *P. umbrella*; WEDD (216) pp. 602, 604.
- †*Pygorhynchus grandiflorus*, n. sp., Londinian, II, c, Minieh, Egypt; MAYER-EYMAR (147) Vierteljahrschr. Ges. Zurich, xliii, p. 48, pl. iii.
- †*Pygurus*:—*P. depressus*; GIRARDOT (79) pp. 576, 591. *P. nummuliticus*, n. sp., Parisian, II, b, El Boraz, Egypt; MAYER-EYMAR (147) Vierteljahrschr. Ges. Zurich, xliii, p. 50, pl. iii.
- †*Pyrina freucheni*, redescr., but not from type; HENNIG (95) p. 8, pl.-figg. 6–10: modification of Desor's diagnosis; SCHLUETER (194) p. 898.
- †*Rhabdocidaris*:—*R. copeoides*; GIRARDOT (79) pp. 576, 613, 617. *R.* cf. *cylindrica*, Caucasus; SPENDIAROFF (202) p. 206. *R. horrida*; GREPIN (90) pp. 8 & 9; PETITCLERC (173) p. 126; GIRARDOT (79) pp. 147,

- 193, 218, 224, 232, 234, 240, 259, 278, 279, 303, 324, 711. *R. libyensis*, **n. sp.**, Lower Eocene, Libyan series, near Assiut, Egypt; GREGORY (89) Geol. Mag. (n. s.) dec. iv, vol. v, p. 150, pl. v. *R. moreauvi*; GIRARDOT (79) pp. 133, 136, 656. *R. cf. nobilis*, Caucasus; SPENDIAROFF (202) p. 206. *R. sp.*; PETITCLERC (173) p. 126.
- +*Rhynchopygus zitteli*; GREGORY (89) p. 155.
- +*Rotuloides fimbriata*; POMEL (175) p. 287.
- Salenia hastigera*; KOEHLER (117) p. 9. +*S. jerofejewi*, Senonian, Simbirsk; LAHUSEN (127) p. 173, fig. 237. *S. miliaris*, **n. sp.**, 782–1672 fms. off Mariato Pt., near Cocos Id. and Malpelo Id., Galapagos Is.; AGASSIZ (2) Bull. Mus. Harvard, xxxii, p. 74, pl. ii. +*S. scutigera*, Cuba; EGOZCUE (55) p. 8, pl. i. +*S. (or Acrosalenia)*, **sp.**, with abnormal apex; SIMIONESCU (198) p. 26.
- Salmacis globator*, New Zealand **sp.** so referred is probably *S. alexandria*; FARQUHAR (61) p. 302.
- Salmacopsis pulchellimus*, **n. sp.**, Tomo, Japan; YOSHIWARA (228) Annot. zool. Japon. ii, p. 59.
- +*Sarsella*:—*S. fischeuri*, **n. sp.**, Cartennian (p. 3, pl. A xxiii), *S. mauritanica* (p. 1): Algeria; POMEL (175).
- +*Schizaster barbarus*, **n. sp.**, Helvetian (p. 75, pls. A x & xxv), +*S. bocchus*, **n. sp.**, Helvetian (p. 81, pl. A xxvi), +*S. bogud*, **n. sp.**, Cartennian (p. 83, pl. A xxvi): Algeria; POMEL (175). *S. canaliferus*; MARION (146) p. 166. +*S. cavernosus*, **n. sp.**, Helvetian (p. 76, pl. A xxv), +*S. christoli*, **n. sp.**, Cartennian (p. 84, pl. A xxvii), +*S. concinnus* (p. 94), +*S. cruciatus*, **n. sp.**, Cartennian (p. 98, pl. A xxvii), +*S. curtus*, **n. sp.**, Cartennian ? (p. 78, pl. A xiv), +*S. fischeuri* (p. 99, pls. A xxviii & xxix): Algeria; POMEL (175). +*S. gaudryi*, anterior ambulacral furrow enlarged, ? as marsupium; GREGORY (89) p. 160. +*S. indigenus*, **n. sp.**, Londinian, i, b, and Parisian, i, c, near Esneh and Beni Gulf, Egypt; MAYER-EYMAR (147) Vierteljahrschr. Ges. Zurich, xliii, p. 53, pl. vi. *S. latifrons*, **n. sp.**, 995 fms. Station 3431 in G. of Panama; AGASSIZ (2) Bull. Mus. Harvard, xxxii, p. 81, pl. xi. +*S. letourneuxi*, **n. sp.**, Cartennian (p. 79, pl. A xxvi), +*S. macCarthyi* (p. 91), +*S. maurus*, **n. sp.**, Lower Pliocene (p. 87, pls. A xii, xxviii & xxix), +*S. meslei* (p. 93): Algeria; POMEL (175). +*S. mongei*, **n. sp.**, Londinian, i, b, Wady Siut, Egypt; MAYER-EYMAR (147) Vierteljahrschr. Ges. Zurich, xliii, p. 54, pl. vi. +*S. mokattamensis*; GREGORY (89) p. 160. +*S. nicaisei*, **n. sp.**, based on *Hemiaster obesus* Nic. non Desor., Nummulitic Limestone (p. 95, pl. A xvii), +*S. numidicus*, **n. sp.**, Helvetian (p. 103, pls. A xxviii & xxix): Algeria; POMEL (175). +*S. parkinsoni*, Cuba; EGOZCUE (55) p. 84, pl. xxvii. +*S. phrynus*, **n. sp.**, based on *S. scillæ* Nic. non Ag. et Des., and incl. ? *S. eurynotus* Wright non Agass., Helvetian (p. 101, pl. A xxix); +*S. rocardi*, **n. sp.**, Eocene ? (p. 86, pl. A xxvii); +*S. sahelensis*, **n. sp.**, Sahelian (p. 72, pl. A xii), **n. var.**, *attenuatus*, Sahelian (p. 74, pl. A x), **n. var.** *dilatatus*, Sahelian (p. 73, pls. A x & xxv): Algeria; POMEL (175). +*S. scillæ*, Cuba; EGOZCUE (55) p. 82, pl. xxvi. +*S. speciosus*, **n. sp.**, Pliocene (p. 70, pl. A xi), +*S. subcentralis*, **n. sp.**, Cartennian (p. 96, pl. A xiv): Algeria; POMEL (175). +*S. thebensis*; GREGORY (89) p. 160. *S. townsendi*, **n. sp.**, 146–995 fms., various stations in G. of Panama, and 50 miles S. of Guaymas; AGASSIZ (2) Bull. Mus. Harvard, xxxii, p. 82. +*S. vicinalis*; POMEL (175) p. 89: Mid. Eocene of Aintâb, Syria; KINKELIN (115) p. 162. +*S. zitteli*; GREGORY (89) p. 160.
- +*Schizechinus*, made sub-genus of *Anapesus*; POMEL (175) p. 297: see under *Psammechinus duciei*.
- +*Schizobrissus*:—*S. mauritanicus*, **n. sp.**, Cartennian (p. 59, pls. A iii & iv), *S. sahelensis*, **n. sp.**, Sahelian (p. 61, pl. A xxiii): Algeria; POMEL (175).

- +*Scutella*:—*S.*, vel *Clypeaster*, *gabbi*, & *S. interlineata*; MERRIAM (151). *S. irregularis*, **n. sp.** (p. 278, pl. B xiii), *S. obliqua*, **n. sp.** (p. 279, pl. B xiv): Cartennian, Algeria; POMEL (175). *S. patagonensis*, see *Iheringia*. *S. sublaevis*, **n. sp.**, Eocene, Algeria; POMEL (175) p. 277, pl. B xii. *S. subrotunda*, var. *paulensis*, Egypt; GREGORY (89) p. 153. *S. tetragona*, probably not a *Præscutella*, Algeria; POMEL (175) p. 277. *S. sp.*, Miocene, Sambuci, Italy; ANGELIS D'OSSAT (9) p. 295.
- +*Scutellina* [of Tate's previous list] "is a misprint for *Scutella*"; TATE (205) p. 411.
- +*Semiclypeus*, **n. s.-g.** of *Clypeus*, with genotype *C. pretiosus*, **n. sp.**, Parisian, I, a, Mokattam, Egypt; MAYER-EYMAR (147) Vierteljahrschr. Ges. Zurich, xliii, p. 48, pl. iii.
- +*Sismondæa* [? intended for *Sismondia*]:—*S. macrophylla*, **n. sp.**, Parisian, II, b, c, Wady el Tih, Cairo, & *S. zitteli*, **n. sp.**, Londinian, II, c, Minieh, Egypt; MAYER-EYMAR (147) Vierteljahrschr. Ges. Zurich, xliii, p. 47, pl. iii.
- +*Sismondia*:—*S. desorii*; POMEL (175) p. 289. *S. logotheti*, in Londinian II of Upper Egypt; *S. planulata* and *S. sæmanni*, Nummulitic Limestone of Mokattam: FOURTAU (67) p. 85.
- Spatagodesma*, **n. g.** of Spatangoid, with no sp. named, but "specimens" were obtained "during the voyage of the Albatross from New York to San Francisco"; AGASSIZ (2) Bull. Mus. Harvard, xxxii, p. 83, pl. xii.
- +*Spatangus asper*, **n. sp.**, Sahelian, Algeria; POMEL (175) p. 16, pl. A xviii. +*S. austriacus*, Miocene, Sambuci, Italy; ANGELIS D'OSSAT (9) p. 292. +*S. botto-miccaï*, **nom. nov.**, pro *S. manzonei* Botto-Micca; VINASSA DE REGNY (215) footnote. [The ignorance shown on p. 83 of last year's Record may be excused by the fact that this new name was published in a footnote to an unsigned review.] +*S. excisus*, **n. sp.**, Sahelian (p. 14, pls. A ii, xviii, also pl. A xv as *S. depressus* junior), +*S. flamandi* Delage, redescr., Pliocene (p. 24, pl. A xx), +*S. oranensis*, **n. sp.**, Sahelian (p. 22, pl. A ii), +*S. pauper*, **n. sp.**, Pliocene (p. 23, pls. A i & ii): Algeria; POMEL (175). *S. purpureus*, sciagram; WOLFENDEN (227) pl. xii: with commensal mollusc; GRIEG (91) p. 27: *Echinopluteus*, redescr.; MORTENSEN (156) p. 150, and (157) p. 105. +*S. sahelienis*, **n. sp.**, Sahelian (p. 13, pl. A xv), +*S. simus*, **n. sp.**, Pliocene (p. 17, pl. A xxi), +*S. subinermis*, **n. sp.**, Pliocene (p. 20, pls. A i, ii, xix, xxi), +*S. tessellatus*, **n. sp.**, Helvetian (p. 12, pls. A xv, xix), +*S. varians*, **n. sp.**, Pliocene (p. 18, pls. A xix & xx): Algeria; POMEL (175).
- Sperosoma* [melius *Sparosoma*] (p. 15) and *S. grimaldii*, detailed description of test, Stewart's organs, mesenteries, intestinal siphon; KOEHLER (117) p. 16, pls. ii, iii, iv, ix: also figd. by ALBERT, Prince of MONACO, Nature, lviii, p. 202, June 30.
- Sphærechinus granularis*; KOEHLER (117) p. 23; +POMEL (175) p. 296, pl. C xxii: incl. *S. albidus*; PALLARY (168): hybrid-larva; DRIESCH (54) and VERNON (214): unripe ovum and response to spermatozoon; IWANZOFF (104): fertilisation and segmentation of ovum; ERLANGER (59). *S. sp. 1*, *Echinopluteus* = *Echinus brevispinosus* Risso, redescr.; MORTENSEN (156) p. 115, and (157) p. 81. *S. sp. 2*, *Echinopluteus*; MORTENSEN (156) p. 117, and (157) p. 83.
- +*Stereocidaritis australis*; TATE (205) p. 411. See also under *Cidaritis*.
- +*Stomechinus*:—*S. andinus*, Chile; FUCINI (71) p. 2. *S. calloviensis* (pp. 563, 576, 591, 597), *S. heberti* (pp. 345, 377, 391, 401, 576, 591), *S. schlumbergeri* (pp. 345, 514), *S. serratus* (pp. 345, 377, 391, 401, 514); GIRARDOT (79). *S. sulcatus*; LAMBERT (128) p. 152; PETITCLERC (173) p. 130; GIRARDOT (79) pp. 193, 206, 218, 224, 231, 711.
- Strongylocentrotus dröbrachiensis* [sic passim]; KOEHLER (117) p. 24. *S.*

- dræbachiensis*, *Echinopluteus*; MORTENSEN (156) p. 128, and (157) p. 90, pls. vii & viii. *S. lividus*; KOEHLER (117) p. 24; PALLARY (168); †POMEL (175) p. 294, pls. C, xii & xiii: ovum; DELAGE (43): unripe ovum and response to spermatozoon; IWANZOFF (104): hybrid larvæ; DRIESCH (54) and VERNON (214): *Echinopluteus*, redescr.; MORTENSEN (156) p. 126, text-fig. 10, and (157) p. 89, text-fig. 10. See also *Toxopneustes*.
- †*Taxophyma*, n. g., see under *Psammechinus lyonsi*.
Temnechinus maculatus, pedicellaria; KOEHLER (117) p. 21, pl. viii.
- †*Temnocidaris danica* Desor sp. is the only Cidarid known in Faxö limestone; SCHLUETER (194) p. 904.
- †*Thagastea luciani*; FOURTAU (66) p. 84.
Toxobrissus pacificus, n. sp., Sandwich Is., Zanzibar, and ? Pt. Mala; AGASSIZ (2) Bull. Mus. Harvard, xxxii, p. 83, pl. xi.
- Toxopneustes dræbachiensis*; LÖNNBERG (134) p. 47. *T. variegatus*; CLARK (34) p. 412 and (35) p. 4: local name "pindá"; IHERING (102) p. 155.
- †*Trachyaster*, n. g., with genotype *T. globulus*, n. sp., Sahelian, Algeria; POMEL (175) p. 109, pl. A ix.
- †*Trachypatagus*:—*T. ? brevis*, n. sp., Sahelian (p. 32), *T. gouvini*, n. sp., Pliocene (p. 31, pl. A xxiii), *T. oranensis*, n. sp., Sahelian (p. 30, pl. A xvi), *T. tuberculatus* Wright (olim *Spatangus*), incl. *Macropneustes peroni* Cott., redescr. from Cartennian (p. 29, pl. A xxii): Algeria; POMEL (175).
- Trigonocidaris albida*, plates of periproct; KOEHLER (117) p. 22.
Tripylus discussed; POMEL (175) pp. 69 & 70.
- †*Tuberaster* discussed, and *T. tuberculatus*; POMEL (175) pp. 8 & 9.
Urechinus giganteus, n. sp., 995 fms. off Altata, G. of California; AGASSIZ (2) Bull. Mus. Harvard, xxxii, p. 79, pl. viii.

(D.)—ASTEROIDEA.

General account; LAHUSEN (127) p. 158.

Anthea tuberculosa, "Krystallkörper"; DOEDERLEIN (50) p. 493.

Asteracanthion foncki Phil. (Museum name)=*A. antarctica* Ltk.; *A. germaini* Phil. 1858=*A. tomidata* Sl. 1889; *A. luridum* Phil. 1858=*A. sulcifera* Perr., 1869; *A. spectabilis* Phil. 1870=*A. sulcifera* Perr. 1869; MEISSNER (150). *A. sulcifera* see *A. luridum* and *A. spectabilis*. *A. tomidata* see *A. germaini*.

Asterias atlantica, v. *A. tenuispina*. *A. calamaria*, two forms at Nelson and Wellington respectively, addition of arms during growth, habitat, giant specimen; FARQUHAR (60) p. 187. *A. forbesi*; DAVENPORT (42) p. 686. *A. glacialis*; MARION (146) p. 172: ♀, with ♂ regions in ovaries; CUÉNOT (41) p. 273 footnote: fertilisation and segmentation of ovum; ERLANGER (59): larva affected by various chemicals; HERBST (96). *A. hispida*, first occurrence on Swedish coast, Öresund; *A. muelleri*; LÖNNBERG (134) p. 48. *A. murrayi*, sciagram; WOLFENDEN (227) pl. ii. *A. pallida*, metamorphosis, stone-canal communicates with axial sinus; GOTO (81). *A. rubens*; LÖNNBERG (134) p. 48: sciagram; WOLFENDEN (227) pl. i: in oyster-parks at Cete; KOEHLER (120): dissection; KÜKENTHAL (123) p. 113: 6-rayed; GADEAU DE KERVILLE (74) p. 334, pl. ii: *Bipinnaria*, discussed, with fig. of muscle-system; MORTENSEN (156) pp. 56, 159, pl. ii, and (157) p. 42, pl. iv. *A. rupicola* not a New Zealand form, that so named by Hutton being *Stichaster suteri*; FARQUHAR (60) p. 189. *A. stellionura* in numbers in White Sea; KNIPOWITSCH (116) p. 318. *A. tenera*, stone-canal communicates with axial sinus; GOTO (81) p. 271, fig. 43. *A. tenuispina*, includes *A. atlantica*, variation in number of rays;

- CLARK (34) pp. 408, 411. *A. vulgaris*, regeneration; KING (114): *Bipinnaria* (= *A. pallidus* Agass.); MORTENSEN (156) pp. 55, 159, and (157) p. 41.
- Asterina folium*, habitat, one blue; CLARK (34) pp. 408, 411: measurements, variation in colour; CLARK (35) p. 6. *A. gibbosa*, protandry; CUÉNOT (41): ovum, filaments in cytoplasm; BOUIN (22): origin of body-cavities; GOTO (80): stone-canal communicates with axial sinus; GOTO (81) p. 271, fig. 47: metamorphosis; GOTO (82). *A. minuta*; CLARK (35) p. 6. *A. stellifera*; IHERING (102) p. 155.
- Asteropsis vernicina*, "Krystallkörper"; DOEDERLEIN (50) p. 493.
- Astropecten antillensis* and *A. articulatus*; CLARK (35) p. 5. *A. bispinosus*, stone-canal communicates with axial sinus; GOTO (81) p. 271, fig. 42. *A. brasiliensis*; IHERING (102) p. 155. *A. duplicatus*; CLARK (35) p. 5. *A. irregularis*, sciagram; WOLFENDEN (227) pls. iii & iv. †*A.* = (*Asterias jurensis* Goldf.); GIRARDOT (79) p. 632.
- Bipinnaria abbreviata*, **n. sp.**, Labrador current; (156) p. 50, pl. ii, and (157) p. 37, pl. iii; *B. affinis*, **n. sp.**, N. Equatorial current; (156) p. 49, pl. i, and (157) p. 36, pl. ii: MORTENSEN. *B. asterigera*, St. Andrews Bay, young of *Luidia* sp. indet.; MCINTOSH (143) pl. ii. *B. buryi*, **n. sp.**, Naples = "*Bipinnaria* of *Asterias glacialis*?" of Bury, but this doubtful; (156) p. 42, and (157) p. 31; *B. elegans*, **n. sp.** = "*Bipinnaria* von Marseille" of Müller, perhaps of *Asterias tenuispinus*; (156) p. 44, text-fig. 2, and (157) p. 32, text-fig. 2; *B. gøttei*, **n. sp.**, Naples, probably of *Astropecten*; (156) p. 40, and (157) p. 30; *B. inflata*, **n. sp.**, Guinea current; (156) p. 50, pl. ii, and (157) p. 37, pl. iii; *B. laevis*, **n. sp.** = "*Brachiolaria* von Helsingör" of Müller, probably of *Asterias glacialis*; (156) p. 58, and (157) p. 43; *B. latifrons*, **n. sp.**, Florida current; (156) p. 46, pl. i, and (157) p. 34, pl. iii; *B. megaloba*, **n. sp.**, Sargasso sea, probably of *Asterias*; (156) p. 60, pl. ii, and (157) p. 44, pl. iii; *B. metschnikoffi*, **n. sp.**, Spezia, probably of *Astropecten*; (156) p. 37, text-fig. 5, and (157) p. 28; *B. mülleri*, **n. sp.** = "*Bipinnaria* von Triest" of Müller, probably of *Astropecten*; (156) p. 39, and (157) p. 29; *B. papillata*, **n. sp.** = "*Brachiolaria* von Messina" of Müller, probably of *Asterias tenuispinus*; (156) p. 60, and (157) p. 44; *B. reflexa*, **n. sp.**, C. Verde and Fernando Noronha; (156) p. 48, pl. i, and (157) p. 35, pl. ii; *B. russoi*, **n. sp.**, Naples = *Bipinnaria* of *Asterias glacialis* apud Russo, but this doubtful; (156) p. 41, and (157) p. 30; *B. simplex*, **n. sp.**, Azores, perhaps also Bermudas; (156) p. 42, pl. i, and (157) p. 31, pl. ii, figg. 3 & ? 4; *B. wilsoni*, **n. sp.**, E. coast of N. America, after figure in BROOKS, Handbk. Invert. Zool.; (156) p. 47, and (157) p. 35: MORTENSEN.
- †*Crenaster prisca*; PETITCLERC (173) p. 131.
- Cribrella compacta*, probably incl. the specimen identified by Hutton as *C. oculata* (p. 191); *C. lukinsii*, **n. sp.**, Carnley Harbour, Auckland Is. (p. 190); *C. ornata* (p. 190): FARQUHAR (60). *C. sanguinolenta*; LÖNNBERG (134) p. 48: stone-canal communicates with axial sinus; GOTO (81) p. 271, figg. 44 & 45.
- Culcita schmideliana*, "Krystallkörper" (p. 493), measurements of growth-stages compared with *Goniodiscus sebæ* (p. 496); DOEDERLEIN (50). *C. sp.*, shelters a Crustacean; COUTIÈRE (38) p. 238.
- Culcitidae*, redefined, incl. *Culcita*, *Asterodiscus*, *Anthenea*, *Goniodiscus sebæ*, *G. studeri*; DOEDERLEIN (50) p. 502.
- Cycethra simplex*, see *Goniodiscus verrucosus*.
- Echinaster echinophorus*; IHERING (102) p. 155. *E. spinosus*; CLARK (35) p. 6.
- Goniodiscus articulatus*, "Krystallkörper" (p. 493), referred to *Pentacerotidae* (p. 502); DOEDERLEIN (50). *G. penicillatus* Phil. 1870 = *Odontaster meridionalis* E. Smith, 1876; MEISSNER (150). *G. pleya-*

- della, "Krystallkörper" (p. 493), referred to *Pentacerotidae* (p. 502); *G. sebæ*, "Krystallkörper" (p. 491), growth-stages (p. 494), incl. *Hosea spinulosa* Gray: DOEDERLEIN (50). *G. verrucosus* Phil. 1857 = *Cycthra simplex* Bell, 1881; MEISSNER (150).
- Gymnasteria carinifera*, "Krystallkörper"; DOEDERLEIN (50) p. 493.
- Gymnasteriidae*, discussed; DOEDERLEIN (50) p. 503.
- Henricia sanguinolenta*, sciagram; WOLFENDEN (227) pls. xi & xii.
- Hippasteria*, referred to *Pentagonasteridae*; DOEDERLEIN (50) p. 502.
- †*Leptogonium mauritanicum*, n. sp., also as *L. sahelensis*, Sahelian, Algeria; POMEL (175) p. 329, pl. D i.
- Linckia guildingii*; CLARK (34) p. 412, and (35) p. 6.
- Luidia alternata*; CLARK (35) p. 5. *L. ciliaris*, sciagram; WOLFENDEN (227) pls. v & vi: St Andrews; M'INTOSH (143) p. 108: *Bipinnaria*, probably incl. Bury's *Bipinnaria* of *Luidia* sp.; MORTENSEN (156) p. 54, and (157) p. 40. *L. clathrata*; IHERING (102) p. 155: two varieties (? spp.) in Jamaica; CLARK (35) p. 5. *L. sarsi* (?) seu *ciliaris*, sciagram; WOLFENDEN (227), pl. vii. *L. sarsi*, St Andrews; M'INTOSH (143) p. 108: "*Bipinnaria asterigera*" of Sars, redescri., probably incl. Garstang's *Bipinnaria* of *Luidia* from Plymouth; MORTENSEN (156) p. 51, and (157) p. 38. *L. savignyi*, St Andrews, breeding period; M'INTOSH (143) p. 108. *L. senegalensis*; IHERING (102) p. 155; CLARK (35) p. 5.
- Nidorellia armata*, "Krystallkörper"; DOEDERLEIN (50) p. 493.
- Odontaster meridionalis*, see *Goniodiscus penicillatus*.
- †*Palæaster*:—*P. eucharis*, Hamilton group, Bartlett's Mills, Ont.; WHITEAVES (222) p. 376. *P. sp.*, numerous specimens on *Tetradium* in limest. below Clinton, near Enterprise, Ohio; FOERSTE (62) p. 186.
- Palmipes placenta*, sciagram; WOLFENDEN (227), pls. viii & ix.
- Pentaceros muricatus*, "Krystallkörper"; DOEDERLEIN (50) p. 493. *P. reticulatus*; CLARK (35) p. 5; IHERING (102) p. 155. †*P. sp.*, ossicles in Miocene of Piedmont; probably includes *Taurogypsina*; SACCO (190) p. 72.
- Pentaceropsis obtusatus*, "Krystallkörper"; DOEDERLEIN (50) p. 493.
- Pentacerotidae* redefined, incl. *Pentaceros*, *Nidorellia*, *Goniodiscus pleyadella*, *G. articulatus*; DOEDERLEIN (50) p. 502.
- Pentagonaster parvus*?, small individual; CLARK (35) p. 5.
- Phaneraster semilunatus*, "Krystallkörper"; DOEDERLEIN (50) p. 493.
- Porania pulvillus*, sciagram; WOLFENDEN (227) pl. x.
- Pteraster pulvillus*, large specimen R=20 mm.; GRIEG (91) p. 25.
- Solaster endeca*; LÖNNBERG (134) p. 48: stone-canal communicates with axial sinus; GOTO (81) p. 271, fig. 46. *S. papposus*; LÖNNBERG (134) p. 49; GADEAU DE KERVILLE (74) p. 336: sciagram; WOLFENDEN (227) pl. iv.
- Stegnaster wesseli*, slight differences from type; CLARK (35) p. 6.
- Stellaster incei*, "Krystallkörper"; DOEDERLEIN (50) p. 493.
- Stichaster insignis*, local varieties (p. 188). *S. suteri*, var. *laevigatus*, from Auckland Is., and an intermediate var. from Stewart Id. (p. 189); FARQUHAR (60).
- †*Taurogypsina taurobaculata*, probably consists of portions of an Asteroid skeleton; SACCO (190) p. 72.

(E.)—OPHIUROIDEA.

General account; LAHUSEN (127) p. 160.

- †*Achistrum nicholsoni* Etheridge as *Hol.*, regarded as hooks of *Astrophytonid*; SPANDEL (201) p. 38.
- Amphiura antarctica* Ljung. vide *A. chilensis*. *A. chiajei*; LÖNNBERG (134) p. 50; KOEHLER (117) p. 50. *A. chilensis*, incl. *A. antarctica*,

- measurements, colour in spirit, resemblance to *A. occidentalis*; LUDWIG (141) p. 760. *A. denticulata*, detailed description; KOEHLER (117) p. 50, pl. vii. *A. duncani*; KOEHLER (118) p. 67. *A. duplicata*; KOEHLER (117) p. 49. *A. elegans*, regular and irregular arrangement of dorsal plates, reddish colour; GRIEG (91) p. 26. *A. filiformis*; KOEHLER (117) p. 50; LÖNNBERG (134) p. 50. *A. grisea* is the "remarkable Ophiurid from Brazil" of Bell, 1888, autotomy of disc-covering; SLUITER (199) p. 309. *A. longispina*, detailed description; KOEHLER (117) p. 52, pl. ix. *A. palmerii*; GRAVE (87) p. 8. *A. patagonica*, from Juan Fernandez, slight variation from type, to this probably belongs Ljungman's "*A. squamata*" from Talcahuano; LUDWIG (141) p. 764. *A. relictæ*, **n. sp.**, Andaman Is., 7–15 fms., Ganjam coast, 10–25 fms., allied to *A. hastata* and *A. integra*, and less closely to *A. depressa* and *A. andree*; KOEHLER (118) Bull. Sci. France Belgique, xxxi, p. 68, pl. iv. *A. squamata*; KOEHLER (117) p. 53; GADEAU DE KERVILLE (74) p. 336. *A. tenuispina*, additions to Ljungmann's description; KOEHLER (117) p. 53, pl. vi.
- †*Aspidura scutellata* always on internal casts of *Myophoria laevigata*; ENGEL (56) p. lvi.
- Astrophyton clavatum*; KOEHLER (118) p. 115. †*A. ? permianum*, **n. sp.**, Zechstein of Galgenberg, W. of Ranis, of Pössneck, and of Gera; SPANDEL (201) Abh. Ges. Nürnberg, xi, p. 39, pl. xiii. †*A. sahelensis*, **n. sp.**, Sahelian, Algeria; POMEL (175) p. 332, pl. D ii.
- Astroschema koehleri*, **n. sp.**, on a Gorgonid, *Mopsea*, from Amboina, 6 arms, of which 3 are in regeneration; DOEDERLEIN (49) p. 487, pl. xxxvii.
- Euryale aspera*, 160 fms., Bali Str.; KOEHLER (118) p. 114.
- Gorgonocephalus agassizi* (p. 59); *G. eucnemis* of p. 213, Koehler (165) Zool. Rec. 1897, was a wrong determination (footnote): KOEHLER (117). *G. chilensis* (incl. *G. pourtalesi*) and *G. lymani*, distrib., measurements, growth and law of branching of arms, hooks on arms, colour in life, the type of *G. chilensis* was a young form; LUDWIG (141) p. 775. *G. pourtalesi* Lym., vide *G. chilensis*.
- Ophiacantha abyssicola*, *C. aristata*, *O. bidentata*; KOEHLER (117) p. 55. *O. brevispina*, **n. sp.**, B. of Biscay, 166 metres; KOEHLER (117) p. 56, pls. viii & ix. *O. decora*, **n. sp.**, Torres Id., 40 fms., Andaman Is., 20 fms., S. coast of Ceylon, 34 fms.; KOEHLER (118) Bull. Sci. France Belgique, xxxi, p. 80, pl. v. *O. pentagona*, **n. var. armata**, Azores, 2870 metres (p. 55); *O. setosa*, Azores, redescribed with special reference to buccal plates (p. 57, pl. viii): KOEHLER (117). *O. vagans*, **n. sp.**, Torres Id., 40 fms., Coast of Ganjam, 28 fms.; KOEHLER (118) Bull. Sci. France Belgique, xxxi, p. 82, pl. iv.
- Ophiactis abyssicola*, detailed description; KOEHLER (117) p. 46, pls. v & vi. *O. affinis*, slight variations in dorsal plates of disc; KOEHLER (118) p. 71. *O. asperula*, measurements, colour in life and spirit, variation in distrib. of spines; LUDWIG (141) p. 752. *O. balli*; KOEHLER (117) p. 46. *O. brachyura*, **n. sp.**, on a *Spongodes* from Amboina, 6 arms, of which 2 are the larger; DOEDERLEIN (49) p. 485, pl. xxxvii. *O. corallicola*; KOEHLER (117) p. 46. *O. echinata*, **n. sp.**, Azores, 800 metres, based on a very young individual; KOEHLER (117) p. 48, pl. v. *O. kroyeri*, distrib., habitat, measurements, colour in spirit, young carried by adult, ? viviparous; LUDWIG (141) p. 756. *O. macrolepidota*, described, 6 arms, of which 3 are in regeneration; DOEDERLEIN (49) p. 484, pl. xxxvii. *O. muelleri*; CLARK (34) p. 412. *O. sexradia*, slight variations; KOEHLER (118) p. 71.
- Ophiarthrum elegans*, redescr.; KOEHLER (118) p. 108, pl. iii.
- Ophidiaster guildingii*; CLARK (35) p. 6.
- Ophiocampsis pellucida*; KOEHLER (118) p. 87.

- Ophiocnemis marmorata*; KOEHLER (118) p. 84.
- Ophiocnida echinata*; KOEHLER (118) p. 67, pl. v. *O. echinata*, throws off disc-covering along with gonads; SLUITER (199). *O. picteti*, slight variations from the unique type; KOEHLER (118) p. 66.
- Ophiocoma brevipes*; KOEHLER (118) p. 80. *O. crassispina*; CLARK (34) p. 412. *O. echinata*; GRAVE (87) p. 8: development; GRAVE (86). *O. granulata*, sciagram; WOLFENDEN (227) pl. xiv. *O. lubrica*, **n. sp.**, 30–50 fms., Laccadive Is.; KOEHLER (118) Bull. Sci. France Belgique, xxxi, p. 76, pl. iii. *O. nigra*, increase at Falmouth; VALLENTIN (210) p. 261. *O. pumila*; CLARK (34) p. 412; GRAVE (87) p. 8. *O. risei*; GRAVE (87) p. 8. *O. rosula*, sciagram; WOLFENDEN (227) pl. xiv. *O. scolopendrina* incl. *O. erinaceus*; KOEHLER (118) p. 78.
- Ophiocoris forbesi*, Azores; KOEHLER (117) p. 58.
- Ophiocten hastatum*, incl. *O. longispinum* Koehl., detailed description (p. 42, pl. vii); *O. scutatum*, detailed description (p. 44, pl. vii): KOEHLER (117).
- Ophioglypha albidia*; KOEHLER (117) p. 35: a 4-rayed specimen; LÖNNBERG (134) p. 49: *Ophiopluteus*=*Pluteus paradoxus* Müller, redescr.; MORTENSEN (156) p. 69, pl. ii, and (157) p. 49, pl. iv. *O. aspera*, **n. sp.**, Newfoundland, 1267 metres (p. 40, pl. vi). *O. carnea*, described in detail (p. 35, pl. vi); KOEHLER (117). *O. forbesi*, intermediate between *Ophioglypha* and *Ophiomusium*; KOEHLER (118) p. 63. *O. lymani*, Smyth Channel, Patagonia, slight differences from type; LUDWIG (141) p. 471. *O. robusta*; LÖNNBERG (134) p. 49. *O. sarsi*; KOEHLER (117) p. 35: first occurrence so far S., Öresund; LÖNNBERG (134) p. 49. *O. sinensis* (p. 59, pls. ii, iv), *O. stellata*, redescr., compared with *O. carnea* and *O. indica* (p. 59, pl. ii); KOEHLER (118). *O. tessellata*, redescr., with modifications from type; KOEHLER (117) p. 37, pl. vii. *O. texturata*; LÖNNBERG (134) p. 49; KOEHLER (117) p. 35: *Ophiopluteus*=*Pluteus paradoxus*, var. Müller, redescr.; MORTENSEN (156) p. 71, pl. ii, and (157) p. 51, pl. iv.
- Ophiolepis cincta*; KOEHLER (118) p. 66. *O. elegans*, *O. impressa*, and *O. paucispina*; GRAVE (87) p. 8. *O. rugosa*, **n. sp.**, 34 fms., Point de Galle, Ceylon; KOEHLER (118) Bull. Sci. France Belgique, xxxi, p. 64, pl. ii.
- +*Ophioma*, provisional **n. g.** for *O. juliensis*, **n. sp.**, Sahelian, Algeria; POMEL (175) p. 331, pl. D ii.
- Ophiomastix annulosa*; KOEHLER (118) p. 84.
- Ophiomaza cacaotica*, colour (p. 84); *O. mærens*, **n. sp.**, 8 fms., Cantores Id. in Mergui Archipelago (p. 85, pl. ii): KOEHLER (118) Bull. Sci. France Belgique, xxxi.
- Ophiomusium lymani*; KOEHLER (117) p. 42.
- Ophiomyxa*, distribution of genus; PRATT (178) p. 19. *O. brevispina*, **n. var. irregularis**, 28–36 fms., Ceylon, Trincomalee, and Andaman Is.; KOEHLER (118) Bull. Sci. France Belgique, xxxi, p. 110. *O. flaccida*; CLARK (34) p. 412. *O. vivipara* at Falkland Is.; PRATT (178) p. 19: incl. *Ophioscolex coppingeri* Bell, extension of distrib. to Calbuco, measurements, "Glasplättchen" in deeper layers of integument (as also in *O. australis* and *O. pentagona*), dorsal shields on arms, variation in number of arm-spines, colour in life, reproduction, brephic stages; LUDWIG (141) p. 768.
- Ophionereis porrecta*, incl. *O. variegata* and *O. squamata*; KOEHLER (118) p. 74. *O. reticulata*; CLARK (34) p. 412; GRAVE (87) p. 8. *O. schayeri*, fr. Juan Fernandez, relation to New Zealand fauna, measurements, late origin of supplementary dorsal shields, increase in number of arm-spines, colour in life and spirit; LUDWIG (141) p. 764.
- Ophiopholis aculeata*; KOEHLER (117) p. 46; LÖNNBERG (134) p. 50: breeding season; BUMPUS (24) p. 856: ? *Ophiopluteus*, redescr.; MORTENSEN (156) p. 74, pl. iii, and (157) p. 53, pl. v.

- Ophiophthirius*, n. g., with genotype *O. actinometrae*, n. sp., on *A. solaris* from Thursday Id., belongs to *Ophiothrichidae*; DOEDERLEIN (49) p. 486, pl. xxxvii.
- Ophiopluteus affinis*, n. sp., Sargasso Sea, probably of an Amphiurid; (156) p. 85, pl. iii, and (157) p. 61, pl. vi; *O. annulatus*, n. sp. = "Wurm-förmige Asterienlarve" of Müller, not a *Pluteus*, Trieste; (156) p. 93, and (157) p. 66; *O. bimaculatus* Müller sp., redescri., probably of *Amphiura* sp.; (156) p. 82, text-figg. 3, 7, 8, and (157) p. 59, text-figg. 3, 8a, b; *O. claparedei*, n. sp., St Vaast, not a true *Pluteus*; (156) p. 90, text-fig. 9, and (157) p. 64, text-fig. 9b; *O. compressus*, n. sp., Danish seas, probably *Ophiocoma* sp. (156) pp. 81, 159, pl. iii, and (157) p. 58, pl. v; *O. coronatus*, n. sp., Shetlands; (156) p. 88, pl. iv, and (157) p. 63, pl. vi; *O. dubius*, n. sp., Kattegat, probably *Ophioglypha* sp.; (156) p. 74, pl. ii, and (157) p. 53, pl. iv; *O. elongatus*, n. sp., Madeira, vermiform not a *Pluteus*; (156) p. 93, and (157) p. 65; *O. henseni*, n. sp., Bermudas; (156) p. 87, pl. iv, and (157) p. 62, pl. vii; *O. krohnii*, n. sp., Madeira, vermiform not a *Pluteus*; (156) p. 92, and (157) p. 65; *O. metschnikoffi*, n. sp., Spezia, not a true *Pluteus*; (156) p. 89, text-fig. 9, and (157) p. 63, text-fig. 9a; *O. ramosus*, n. sp., N. Atlantic, probably of *Amphiura* sp.; (156) p. 86, pl. iii, and (157) p. 62, pls. vii & viii; *O. robustus*, n. sp., Fernando Noronha; (156) p. 80, pl. iii, and (157) p. 57, pl. v; *O. similis*, n. sp., 19° 20' E., 34° 52' S., probably of an African *Amphiura*; (156) p. 85, pl. iii, and (157) p. 60, pls. v & vi: MORTENSEN.
- Ophiopsila pantherina*, n. sp., 4 fms., Kings Id. in Mergui Archipelago, and 15–35 fms., Table Id.; KOEHLER (118) Bull. Sci. France Belgique, xxxi, p. 72, pl. iii.
- Ophiopteron elegans*, Andaman Is.; KOEHLER (118) p. 88.
- Ophioscolex coppingeri* Bell, vide *Ophiomyxa vivipara*.
- Ophiostigma formosa*; KOEHLER (118), p. 76. *O. isacantha*; CLARK (34) p. 412.
- Ophiothela dane*, 6 arms, of which 3 are in regeneration; DOEDERLEIN (49) p. 486, pl. xxxvii: with var. nov. *involuta*, 7–8 fms., L. Chilka; KOEHLER (118) Bull. Sci. France Belgique, xxxi, p. 88.
- Ophiothrix comata*, redescri., slight variations from type, does not incl. *O. koreana* (p. 105, pl. ii); *O. diligens*, n. sp., 41 fms., Andaman Is., (p. 103, pl. v): KOEHLER (118) Bull. Sci. France Belgique, xxxi. *O. fragilis*, its local occurrence; GADEAU DE KERVILLE (74) p. 336: form *pentaphyllum*; KOEHLER (117) p. 58: *Ophiopluteus*, redescri., observations of Apostolidès rejected; MORTENSEN (156) p. 76, text-fig. 6, pl. iii, and (157) p. 55, text-fig. 7, pl. vi. *O. hirsuta*, incl. *O. punctolimbata*; KOEHLER (118) p. 95. *O. innocens*, n. sp., 34 fms., S. of Ceylon, 6° 1' N., 81° 16' E.; KOEHLER (121) Bull. Soc. zool. France, xxiii, p. 164. *O. insidiosa*, n. sp., 34 fms., Point de Galle, 20 fms., Andaman Is. (p. 91, pl. iv); *O. lepidus*, slight variations from type, perhaps incl. *O. fallax*, relations to *O. purpurea* (p. 102); *O. longipeda* (p. 96): KOEHLER (118) Bull. Sci. France Belgique, xxxi. *O. magnifica*, from Falklands; PRATT (178) p. 18. *O. nereidina*; KOEHLER (118) p. 96. *O. oerstedii*; GRAVE (87) p. 8. *O. otiosa*, n. sp., 36 fms., Malabar coast, allied to *O. demessa* (p. 99, pl. iii); *O. propinqua*, redescribed (p. 97, pl. iii); *O. speciosa*, n. sp., shore of Andaman Is., perhaps closely related to *O. aspidota* (p. 93, pl. iv); *O. stelligera* (p. 99); *O. striolata*, variations from Döderlein's description, colour (p. 89); *O. trilineata* (p. 89); *O. triloba*, length of arm-spines (p. 96); *O. vitrea*, dentary papillæ in 3 rows, the "2 rows" of Döderlein a misprint, slight differences from type (p. 101): KOEHLER (118) Bull. Sci. France Belgique, xxxi.
- Ophiura appressa*; GRAVE (87), p. 8: Bermuda; CLARK (34) p. 412.

O. brevicauda, and *O. brevispina*; GRAVE (87) p. 8. *O. ciliaris*, sciagram; WOLFENDEN (227) pl. xv. *O. guttata*; GRAVE (87) p. 8. *O. olivacea*, breeding season; BUMPUS (24) p. 856.

Pectinura arenosa (p. 58). *P. gorgonia* (p. 58 pl. ii); KOEHLER (118).

Sthenocephalus, n. g. of *Astrophytonidae* with genotype *S. indicus*, n. sp., Gaspar Str., 30 fms.; KOEHLER (118) Bull. Sci. France Belgique, xxxi, p. 112, pl. v.

†*Ucinulina polymorpha* Terquem as Foraminifer, regarded as hooks of *Astrophytonid*; SPANDEL (201) p. 38.

(F.)—CRINOIDEA.

General account, division into *Palæocrinoidea* and *Neocrinoidea* retained; LAHUSEN (127) p. 136. Classification of *Crinoidea* "based upon the number and arrangement of the plates in the calyces"; MILLER (153) p. 670. Classification of Wachsmuth & Springer (336) Zool. Rec. 1897, expounded and criticised; BATHER (14).

†*Acrochordocrinus*? roots, Mid. Lias of Kessik-tash, W. of Angora; POMPECKJ (176) pp. 728, 752, pl. xxx. See also *Cyclocrinus*.

†*Actinocrinus tenuis*; DESTINEZ (47).

Actinometra belli, brachia of young (p. 479, pl. xxxvi); *A. parvicirra*, brachia (p. 479, pl. xxxvi); *A. paucicirra*, brachia, distribution of syzygies, colour (p. 479); *A. pectinata*, cirri, brachia (p. 478); *A. regalis*, cirri, brachia, colour (p. 480); *A. solaris*, cirri, brachia, colour (p. 478); DOEDERLEIN (48).

†*Ancyrocrinus bulbosus*; WHITEAVES (222) p. 375, pl. xlviii.

†*Antedon admirabilis*=*A. avenionensis* var. *minor*, suggested as doubtful n. sp. (p. 405); †*A. allardi*, refigd. (p. 409); NICOLAS (162). †*A. ambiguus*, n. sp., Cartennian, Algeria; POMEL (175) p. 334, pl. D ii. †*A. anglesensis*, refigd. NICOLAS (162) p. 408. †*A. avenionensis*, n. sp., Miocene, Avignon; NICOLAS (161) p. 135, & (162) p. 405, text-fig. *A. bidens*, cirri, brachia, covering-plates on genital pinnules, colour; DOEDERLEIN (48) p. 476, pl. xxxvi. *A. brasiliensis*; IHERING (102) p. 156. †*A. cartenniensis*, n. sp., Cartennian, Algeria; POMEL (175) p. 333, pl. D ii. †*A. depereti*, refigd.; NICOLAS (162) p. 409. *A. elegans*, cirri, colour; DOEDERLEIN (48) p. 475, pl. xxxvi. †*A. fontanensi*, centrodorsal redescri. and figd.; NICOLAS (162) p. 407. †*A. glandiferus[ra]* n. sp., Miocene, Avignon; NICOLAS (161) p. 135, & (162) p. 406, text-fig. †*A. globosus*, n. sp., Cartennian, Algeria; POMEL (175) p. 334, pl. D ii. *A. imparipinna*, brachia; DOEDERLEIN (48) p. 477. †*A. lineatus*, n. sp., Sahelian, Algeria; POMEL (175) p. 335, pl. D ii. *A. ludovici* (p. 477); *A. microdiscus*, cirri, brachia, tegminals, colour (p. 476, pl. xxxvi); DOEDERLEIN (48). †*A. miocenicus[ca]* n. sp., Miocene, Avignon; NICOLAS (161) p. 132, & (162) p. 404, text-fig. †*A. pellati*, centrodorsal redescri. and figd.; NICOLAS (162) p. 407. *A. phalangium*, centrodorsal figd.; NICOLAS (162) p. 410. †*A. pilularis*, n. sp., Miocene, Avignon; NICOLAS (161) p. 134, & (162) p. 405, text-fig. †*A. rhodanicus[ca]* centrodorsal descri. and figd.; NICOLAS (162) p. 403. *A. rosacea*; KOEHLER (117) p. 3: deeper water type; MARION (146) p. 172: decrease at Falmouth; VALLENTIN (210) p. 260: ? Quaternary, Algeria; POMEL (175) p. 336, pl. D ii. †*A. solutus*, n. sp. (p. 336, pl. D ii), †*A. speciosus*, n. sp. (p. 337, pl. D iii): Sahelian, Algeria; POMEL (175). †*A. sphaeroidalis*, descri. and figd.; NICOLAS (162) p. 404.

†*Apiocr.* cf. *elegans*; GIRARDOT (79) pp. 345, 509, 514.

†*Arachnocrinus*, relations to *Petalocrinus*, with diagram of *A. bulbosus*; BATHER (16) p. 437.

Articulata Wachsm. and Spr., name objected to; BATHER (14) p. 343.

- †*Balanocrinus*:—*B. pentagonalis* (pp. 565, 632), *B. subteroides*, et aff. (pp. 86, 91, 92, 101, 122, 133, 134, 137, 142, 146, 651), *B. sp.* (pp. 127, 129, 131, 656); GIRARDOT (79).
- †*Botryocrinus crassus*, olim *Homocrinus*; WHITEAVES (222) p. 375.
- †*Bourgueticrinus*?, in Chalk at Flamborough Hd.; LAMPLUGH (129) p. 181.
- †*Cainocrinus andree*; GREPPIN (90) p. 11.
- †*Corymbocrinus*, found in Silurian of Chicago; WELLER (220) p. 700.
- †*Crotalocrinidæ* relations to *Cyathocrinidæ* and *Petalocrinidæ*; BATHER (16) p. 438.
- †*Crotalocrinus*, found in Silurian of Chicago; WELLER (220) p. 700. *C. rugosus*?; SIEGERT (197) p. 78.
- †*Cyathocrinus*:—*C. ? fischeri*, **n. sp.**, Zechstein [? of Pössneck, but this not definitely stated], founded on fused IB circlet only, [genus absolutely uncertain, but not a *Cyathocrinus*]; SPANDEL (201) Abh. Ges. Nürnberg, xi, p. 30, pl. xii. *C. maxvillensis*, **n. sp.** Maxville limest. (=Chester group), Newtonville, Ohio, incl. *C. inequidactylus* Whitf. non McCoy [but none of this is a *Cyathocrinus*]; WHITFIELD (223) Ann. N. York Ac. v, p. 577, pl. xiii. *C. ? pentagonus*; SIEGERT (197) p. 79. *C. ? ramosus* Schloth., from Zechstein, fully redescribed and figd., is a Poteriocrinid [*sensu latissimo*]; SPANDEL (201) p. 21, pl. xii. *C. ? cf. ramosus*; ROMANOV (184) p. 10. *C. somersi*, redescri. [not *Cyathocr.*, probably *Delocr.*], Coal Measures, Ohio; WHITFIELD (223) p. 596, pl. xv. *C. sp.*, Kungur beds (pp. 294, 360), and Artinsk beds (pp. 270, 354, pl. v, f. 20a, b), both Permo-carboniferous, also Carboniferous (pp. 231, 343), Kama basin, Russia, all columnals only; STUCKENBERG (204).
- †*Cyclocrinus*:—*C. macrocephalus* (pp. 576, 591), *Cyclocrinus sp.* (p. 86); GIRARDOT (79). See also *Acrochordocrinus*.
- †*Dendrocrinus*? sp.; WINTERFELD (226) p. 11.
- †*Dolatocrinus*:—*D. canadensis*; WHITEAVES (222) p. 369. *Dolatocrinus depressus*, **n. sp.**, Hamilton Group, Charlestown, Ind.; MILLER in GREENE (88). *D. subaculeatus*, **n. sp.**, Hamilton group, Bartlett's Mills and Thedford, Ont., previously referred to *D. liratus*, respiratory pores figd. (p. 369, pl. xlviii); *D. cf. tuberculatus*, Hamilton group, Thedford, Ont. (p. 371); *D. sp.* previously referred to *D. lamellosus*, but probably is **n. sp.** (p. 370); WHITEAVES (222) Contrib. Canad. Pal. i.
- †*Encrinites epithonius*, Lenneschiefer; WINTERFELD (226) p. 4.
- †*Encrinos*, true meaning of the name; BATHER (13) p. 248.
- †*Encrinus* Schulze, 1758; BATHER (13) p. 249. *E. liliiformis*, ANASTASIU (5) p. 892.
- †*Entrochus asteriscus*; SIEGERT (197) p. 131.
- †*Eucalyptocrinus crassus*; CALVIN (26) p. 157.
- †*Eupachycrinus verrucosus*; BAIN (11) pp. 273, 278.
- †*Extracrinus subangularis*; GIRARDOT (79) pp. 122, 127, 136, 656. See also *Pentacrinus*.
- Flexibilia* Zittel, name preferred to *Articulata* Wachsm. & Spr.; BATHER (14) p. 343.
- †*Gennæocrinus arkonensis*, **n. sp.**, Hamilton group, Bartlett's Mills, Ont.; WHITEAVES (222) Contrib. Canad. Pal. i, p. 373, pl. xlviii.
- †*Gilbertocrinus spinigerus*; WHITEAVES (222) p. 368: redescri., differences from N. York type, above bone-bed near Columbus, Ohio; WHITFIELD (223) p. 553, pl. xi.
- †*Gissocrinus*, relations to *Petalocrinus*; BATHER (16) p. 437.
- †*Glyptocrinus basalis*; MALAISE (145) p. 258.
- †*Graphiocrinus* De Kon. and Le Hon, restored in preference to the re-definition by Wachsmuth & Springer; MILLER (153) p. 679.
- †*Hexacrinus*:—*H. callosus*? (p. 28), *Hexacrinus* aff. *interseapularis*, cup, and possibly columnals (p. 11, fig. 1 and p. 23); WINTERFELD (226).

- †*Hydreionocrinus kansasensis*, n. sp., Upper Coal Measures, 700 feet below Cottonwood Limestone, at Neal, Greenwood Co., Kansas; WELLER (217) Tr. N. York Ac. xvi, p. 372, pl. xxxvi.
- Isocrinus* v. Meyer, 1837, maintained with type *I. pendulus*=*Pentacr. amblyscalaris* Thurm., and with synn. *Isis* Linn. pars, *Pentacrinus* Miller pars, *Cainocrinus* Forbes, *Picteticrinus* Loriol, *Cenocrinus* and *Neocrinus* W. Thoms.; BATHER (13).
- †*Lobolithus* (= *Camarocrinus*) geogr. and geol. distrib., found in black limestone of Podol, E. Bohemia, regarded as "Brutbefestigungs-apparat"; JAHN (105) pp. 217-220.
- †*Megistocrinus*:—*M. farnsworthi*; CALVIN (27) p. 252. *M. rugosus*, young from Thedford, Ont., with analysis of cup of a cotype; WHITEAVES (222) p. 372.
- †*Melocrinus*:—*M. milwaukensis*, n. sp., with n. var. *rotundus* (p. 121, pl. xiv); *M. nodosus* Hall, redescribed, with n. var. *spinusus* (p. 118, pl. xiv); *M. subglobosus*, n. sp. (p. 120, pl. xiv): all Devonian, Milwaukee, Wis.; WELLER (219) Ann. N. York Ac. xi.
- †*Millericrinus*:—*M. echinatus*; WEDD (216) p. 615. *M. horridus* bored by *Myzostoma*; BOEHM (20) p. 675.
- †*Pentacrinos*, true meaning of the name; BATHER (13) p. 248.
- †*Pentacrinus* Blumenb. 1804, maintained with type *P. fossilis*=*P. britannicus* Schloth. and *P. briareus* Miller, and with synn. *Polycerus* Waldheim pars, *Chladocrinus* Agass., *Extracrinus* Austin; BATHER (13). *P. allardi* "de Loriol," apparently from Miocene of Beaucaire, but the remarks are obscure; NICOLAS (161) p. 137, & (162) p. 397: de Loriol denies paternity of this sp.; PELLAT (170): LAMBERT in Review also admits ignorance of this sp. *P. angulatus*; GIRARDOT (79) p. 651. *P. bajocensis*; PETITCLERC (173) p. 130; GIRARDOT (79) pp. 193, 218, 224, 232, 254, 283, 324, 711, 742, 766. *P. basaltiformis*; GIRARDOT (79) pp. 133, 656: in Serbia; RADOVANOVIC (181) p. 51. *P. berthæi* [melius *berthæ*] n. sp., Miocene of Angles (Gard); NICOLAS (161) Mem. Ac. Vacluse, xvi, p. 137, & (162) p. 397, text-fig. *P. bollensis*; GIRARDOT (79) p. 163. *P. bronni*; SIEGERT (197) p. 94. *P. aff. changarnieri* (pp. 576, 591), *P. cingulatus* (p. 632); GIRARDOT (79). *P. crista-galli*; GIRARDOT (79) pp. 193, 218, 254, 283, 711; PETITCLERC (173) p. 131. *P. flamandi*, n. sp., Cartennian, Algeria; POMEL (175) p. 338, pl. C xiv. *P. (Extracrinus) goniogenos*, n. sp., Mid. Lias of Kessik-tash, W. of Angora, allied to *P. briareus* Miller [*P. fossilis* Blumenb.], based on columnals; POMPECKJ (176) Zeitschr. Deutsch. geol. Ges. xlix, pp. 724, 752, 756, pl. xxx. *P. jurensis*; GIRARDOT (79) pp. 149, 164, 170, 172, 178, 182, 334, 666, 687, 691. *P. (Extracrinus) laevisutus*, n. sp., Mid. Lias of Kessik-tash, W. of Angora, also in Suanetia, allied to *P. subangularis*, detailed account of stem; POMPECKJ (176) Zeitschr. Deutsch. geol. Ges. xlix, pp. 718, 752, 756, 759, 787, pls. xxx & xxxi. *P. lepidus*; GIRARDOT (79) pp. 149, 164, 172, 178, 182, 666, 687. *P. micryensis*; GIRARDOT (79) pp. 149, 164, 170, 172, 178, 182, 666, 687. *P. miocenicus* de Lor. distinguished from *P. gastaldi*; NICOLAS (162) p. 397. *P. nicoleti* (pp. 345, 377, 401, 576, 591), *P. oceani* (pp. 127, 129, 656), *P. oxysealaris* (p. 632); GIRARDOT (79). *P. pierredoni*, n. sp., Eocene, ? Suessonian, Algeria; POMEL (175) p. 339, pl. C xiv. *P. n. sp.*, aff. *sarthacensis* (pp. 576, 591), *P. tuberculatus* (pp. 79-83, 86, 91, 101, 127, 130, 651, 656); GIRARDOT (79). *P. sp.*; WEDD (216) pp. 602, 604, 606, 607, 608. *P. sp.*, Upper Lias of Kessik-tash, W. of Angora; POMPECKJ (176) p. 727.
- †*Petalocrinidae*, n. fam., diagnosed; BATHER (16) p. 438.
- †*Petalocrinus*, geological relations (p. 402), detailed anatomical description (p. 407), diagnosis (p. 420), affinities (p. 436), description of *P. angustus*,

- n. sp.**, Lower Silurian, *b* or *c*, Wisby, Gotland (p. 425, pl. xxv); *P. expansus*, **n. sp.**, Upper Silurian, *f*, Wisby (p. 434, pl. xxv); *P. inferior*, **n. sp.**, Niagara Limestone, Monticello, Jones Co., Ia. (p. 426, pl. xxvi); *P. longus*, **n. sp.**, Niagara Limestone, St. Paul, Ind. (p. 431, pl. xxvi); *P. (?) major* Weller, probable syn. of *Omphyma turbinatum* (p. 407); *P. mirabilis* Weller (p. 427, pl. xxvi); *P. visbyensis*, **n. sp.**, Lower Silurian, *b* and *c*, Wisby, Gotland (p. 421, pl. xxv), with possible mutation *senior*, Lower Silurian, top of *c*, Westergarn, Gotland (p. 424, pl. xxv): BATHER (16) Quart. J. Geol. Soc. liv.
- †*Pisocrinus gemmiformis* in Dayton Limest. of Lower Niagara, near Lewisburg, Ohio (p. 185), in Laurel Limest. at Osgood, Ind. (pp. 191 & 199); FOERSTE (62).
- †*Platycrinus arenosus*; DESTINEZ (47).
- †*Poteriocrinus* sp., columnals only, Carboniferous, Kama basin, Russia; STUCKENBERG (204) pp. 231, 343.
- †*Pycnosaccus*, found in Silurian of Chicago; WELLER (220) p. 700.
- †*Scaphiocrinus* sp.; SOREIL (200) p. lxxix.
- †*Stephanocrinus osgoodensis* in Dayton Limest. of Lower Niagara, near Lewisburg, Ohio (p. 185), in Laurel Limest. at Osgood, Ind. (pp. 191, 199); FOERSTE (62).
- †*Scyphocrinus elegans*; ROUSSEL (186) pp. 282, 284.
- †*Urtocrinus socialis*, description reprinted, two sizes noted, species or growth-stages; LOGAN (133) pp. 481–483, pls. lxxi, cxii, cxiii.
- †*Zeacrinus*:—*Z. mooresi*, redescri., Coal Measures, Ohio; WHITFIELD (223) p. 597, pl. xv. *Z. sp.*; BAIN (11) p. 280.

(†G.)—CYSTIDEA

(including EDRIOASTEROIDEA).

- General account, division into *Eucystoidea*, *Cystocrinoidea*, *Cystasteroidea*, *Cystechinoidea*, *Cystoblastoidea*; LAHUSEN (127) p. 182.
- Ageladiscus*, **nom. nov.** for *Echinodiscus* Worthen and Miller, **nom. preocc.**, [but is anticipated by *Discocystis* Greg. Feb. 1897]; MILLER (154) p. 734.
- Agelacrinus* sp. Murlon 1881, becomes *Dinocystis barroisi*, **n. sp.**; BATHER (16A) p. 543. *A. sp.*, numerous specimens on *Tetradium* in limest. below Clinton, near Enterprise, Ohio; FORESTE (62) p. 186.
- Astrocystites* Whiteaves non *Asterocystis* Haeckel, altered to *Steganoblastus*; WHITEAVES (221).
- Atelecystis* Billings maintained with *A. huxleyi* as type, and incl. *A. balanoides*; MILLER (153) p. 674.
- Caryocrinus ornatus*; CALVIN (26) p. 157. *C. sp.*, in *Meristella crassa* beds, Ordovician, Ringerike, Norway; KIAER (112) p. 17.
- Dinocystis*, **n. g.** of Edrioasteridæ, with genotype *D. barroisi*, **n. sp.**, Uppermost Devonian, Psammites du Condroz, Belgium; BATHER (16A) p. 547, pl. xxi.
- Echinosphæra*, in Pyrenees; ROUSSEL (186) p. 282. *E. aurantium*; SIEGERT (197) p. 50. *E. baltica*; MALAISE (145) p. 258. *E. sp.*, Upper *Chasmops* beds, Ordovician, Kristiania; KIAER (112) p. 34.
- Edrioasteridæ*, **n. fam.**, of Edrioasteroidea, comprising *Edrioaster* and *Dinocystis*; BATHER (16A) p. 547.
- Mesites* Hoffmann non Boheman, nec Geoffroy St Hilaire, nec Jenyns, nec Ludwig, **nom. mut.** *Mesocystis*; BATHER (12).
- Mesocystis*, **nom. nov.** pro *Mesites* (q. v.); BATHER (12).
- Sphæronis munitus* and *S. punctatus*; MALAISE (144) p. lxxvi. *S. stelluliferus*; MALAISE (145) p. 258. *S. sp.* in *Meristella crassa* beds, Ordovician, Ringerike, Norway; KIAER (112) p. 17.

Steganoblastus **nom. nov.** pro *Astrocystites* Whiteaves non *Asterocystis* Haeckel; the type species *S. ottawaensis* is (lapsu calami) quoted as *S. canadensis*; WHITEAVES (221).

(†H.)—BLASTOIDEA.

General account; LAHUSEN (127) p. 191.

Pentremites elegans, redescr. fr. Maxville Limest. Ohio; WHITFIELD (223) p. 577, pl. xiii. *P. lycorias*; WHITEAVES (222) p. 375.

Pentremitidea filosa? (p. 122, pl. xiv); *Pentremitidea milwaukensis*, **n. sp.** (p. 123, pl. xiv); Devonian, Milwaukee, Wis.; WELLER (219) Ann. N. York Ac. xi.

(K.)—INCERTÆ SEDIS.

†*Tesselaria ambigua*, **n. g.** et **sp.**, perhaps not Echinodermal, Sahelian, Algeria; POMEL (175) p. 339, pl. D iii.

XV. VERMES.

BY

FLORENCE BUCHANAN, B.Sc.

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INTRODUCTION.

WHAT little work has been done on the *Hemichorda* during the year will be found recorded on p. 56.

Most of the work on the *Rotifera* (see p. 56) relates to their distribution geographically and bathymetrically. There are however a few important papers on the reproductive process in different species, and on cyclical variations (p. 58).

The internal anatomy of the *Gephyrea* is dealt with by BRUMPT, JAMESON (2) & MÉTALNIKOFF.

A good deal of important work on the *Polychæta* has been done, amongst which may be mentioned the following:—The monograph of the *Maldanidæ* of the Gulf of Naples by ORLANDI (222). The well illustrated and most useful work of SAINT-JOSEPH on the Polychætes of the Coast of France (267). The description of new species of Pacific *Amphinomidæ*, *Aphroditidæ*, &c. by JOHNSON (130). The identification, and account of the interesting life-history, of "Palolo" by FRIEDLÄNDER (68) and EHLERS (54). The likewise most interesting life-history of *Dodecaceria* and other Cirratulids given in detail by MÉSNIL & CAULLERY (78). The revision of the *Ariciadæ* and allied families by MÉSNIL & CAULLERY (181). A much-needed account of the structure and habits of *Arenicola* by GAMBLE & ASHWORTH (82).

On the development of the *Polychæta* there is the important work of EISIG on that of the *Capitellidæ* (56), supplementary to his monograph on the family, comparing it with that of other Polychætes and of other animals. MEYER'S "Researches on the development of annelids" (183) looks interesting and is well illustrated but is unfortunately in Russian. HÄCKER (108) has a valuable monograph on pelagic larvæ of the Plankton Expedition and describes two new types of such larvæ. MICHEL (188)—(198) has a series of papers on the regeneration of different organs in polychætes.

As regards separate organs or systems of organs, HAMAKER'S study of the nervous system of *Nereis* (110), GRAVIER'S on the prostomium of the *Glyceridæ* (95), GOODRICH'S on the nephridia of the same family (92), PICTON'S on the "Herzkörper" of different families (229), and GRUVEL & KUNSTLER'S on the cœlomic fluid of the *Opheliadæ* (100) are the most noteworthy.

With regard to the *Oligochæta*, besides the systematic work of MICHAELSEN, ROSA, EISEN, and FEDARB, and the description of a new genus of *Enchytræidæ* by EMERY (57), BRODE'S account of the morphology of *Dero* may be noted (23). HAASE (106) has an important contribution on the process of regeneration in *Tubifex* especially that of the nervous system and alimentary canal.

The nervous system of the *Hirudinea* has received a good deal of attention, see especially APÁTHY, BAYER, BRISTOL, CSIKY, RETZIUS, SOUKATSCHOFF and MOORE. JOHANSSON (129) discusses the relationships of the *Ichthyobdellidæ*.

The nervous system of the *Cestoda* is dealt with by COHN (43); the detailed anatomy of cestodes of aplacental mammals by ZSCHOKKE (332), of *Tænia inflata*, Rud., by JACOBI (122), of *Archigetes appendiculatus* by MRÁZEK (208). Interesting new Cestodes are described by LÜHE (166) and by LÖNNBERG (160).

SAINT-RÉMY (268) gives a revised synopsis of the monogenetic *Trematoda* to replace his old one. PRATT (232) gives a detailed account of the anatomy and life history of the appendiculate Distomids; JÄGERSKIÖLD (123) of *Distomum lingua*, Creplin. The genera *Dactylocotyle* and *Merizocotyle* are fully dealt with by CERFONTAINE (34 & 35), *Temnocephala* by MONTICELLI

(204). KOWALEWSKI (140) gives instances of double inverse symmetry of the genital organs, or as he calls it "sexual amphitypy," in *Opisthorchis*.

The nervous system, alimentary canal, proboscis and proboscis-coelome of the *Nemertinea* form the subject of the new parts of the Supplement to Vol. iv. of Bronn's *Klassen und Ordnungen des Thierreichs*, see BÜRGER (28). The anatomy and histology of *Stichostemma* and *Geonemertes* is fully detailed by BÖHMIG (13). ARNOLD (6) describes the development of *Lineus* comparing the larva with the *Pilidium*-larva throughout.

The *Turbellaria* of the French side of the Channel, including several new ones, are described by FUHRMANN (74). The Planarians of Illinois and of the Gt. Barrier reef of Australia by WOODWORTH (327 & 328). The distribution of the Indo-Malay Land-Planarians is dealt with by v. GRAFF (94); the development of Polyclads by FRANCOTTE (67). MORGAN (206) gives an account of experiments on regeneration in Planarians, and FLEXNER (63) of the histological processes concerned therein.

BRANDES (20) points out the diversity of type in the nervous systems of the groups included under the heading "Nemathelminthes," and regards the 4 groups *Nematoda*, *Gordiaceæ*, *Acanthocephala* and *Chaetognatha* as quite independent of one another. CHOŁODKOWSKY (38) also considers the *Acanthocephala* as more nearly related to the Platyhelminthes, and especially to the Cestodes, than to Nematodes. The phagocyte-organs of Nematodes are again discussed by NASSONOW (211-213) and JÄGERSKIÖLD (124). NEDKOFF (215) describes the anatomy of *Ascaris nigrovenosa*. MONTGOMERY (200-203) has several papers on the *Gordiidae*; v. LINSTOW (157) one on the genus *Mermis* dealing chiefly with the life-histories of different species.

I. TITLES.*

[ANNELIDA, PLATYHELMINTHES AND NEMATHELMINTHES.]

1. ANDREINI, A. Caso di Echinococco del cuore umano. Bull. Soc. Rom. Stud. Zool. vi, pp. 227-233, 1 fig.
2. ANDREWS, E. A. (1) Activities of polar bodies of *Cerebratulus*. Arch. Entwickmech. vi, pp. 228-248, 24 figg. in text.
3. —. (2) Filose activity in Metazoan eggs. Zool. Bull. ii, pp. 1-13.
4. APÁTHY, S. (1) Das leitende Element des Nervensystems und seine topographischen Beziehungen zu den Zellen. Erste Mitth. Mt. Stat. Neapel, xii, 1897, pp. 495-748, pls. xxiii-xxxii.
Criticised by GARBOWSKI, Biol. Centrbl. xviii, pp. 488, 536. Criticism answered by APÁTHY (2).
5. —. (2) Bemerkungen zu Garbowski's Darstellung meiner Lehre von den leitenden Nervelementen. T. c. pp. 704-713.
6. ARNOLD, G. Zur Entwicklungsgeschichte des *Lineus gesserensis* O. F. M. (*L. obscurus* Barrois). Trudui St. Peterb. Obshch. xxviii, pp. 1-30, pl. i.
In Russian, with French résumé. Abstract, Zool. Centrbl. vi, pp. 126-128.
— [See also PEDASCHENKO (226).]

* An asterisk prefixed to a quotation indicates that the Recorder has not seen the Journal or Work referred to.

7. ARWIDSSON, I. Studien über die Familien *Glyceridæ* und *Goniadæ*. Bergens Mus. Aarbog, 1898, No. 11, 70 pp., 4 pls.
ASHWORTH, J. H. [See GAMBLE & ASHWORTH (82).]
8. ASKANAZY, M. Rundwurm (*Rhabdonema*). Schr. Ges. Königsb. 78th year, p. 50.
9. AURIVILLIUS, C. W. S. Vergleichende thiergeographische Untersuchungen über die Planktonfauna des Skageraks in den Jahren 1893–1897. Svenska Ak. Handl. xxx, 426 pp.
A few annelid larvæ, rotifers and Chætognaths from different localities in different months of the year, including numerous tables.
10. BAYER, E. Hypodermis und neue Hautsinnesorgane der Rhychobdelliden. Zeitschr. wiss. Zool. lxiv, pp. 648–727, pls. xxiii–xxv, and 10 figg. in text; also in SB. Böhmisch. Ges. 1898.
Abstract, with 4 figg., Zool. Centrbl. vi, pp. 182–185.
11. BEARD, J. The sexual condition of *Myzostoma glabrum* F. S. Leuckart. Mt. Stat. Neapel, xiii, pp. 293–324, pl. x.
BILLET, A. [See GIARD & BILLET (88).]
BIRULA, A. [See PEDASCHENKO, D. (226).]
12. BLANCHARD, R. Vicissitudes de la nomenclature helminthologique. Arch. parasit. i, pp. 350–351.
Remarks on nomenclature of Cestodes in Bronn's Klassen und Ordnungen des Thierreichs. See reply by BRAUN, Zool. Centrbl. v, p. 891.
13. BÖHMIG, L. Beiträge zur Anatomie und Histologie der Nemertinen (*Stichostemma gracense* Böhmig, *Geonemertes chalicophora* Graff.) Zeitschr. wiss. Zool. lxiv, pp. 479–564, pl. xiii–xvii, and 1 fig. in text.
Critical Abstract, Zool. Centrbl. v, pp. 667–672.
14. BOLSUS, R. P. H. (1) Note sur un organe glandulaire récemment découvert dans l'*Hæmentaria officinalis*. Ann. Soc. Bruxelles, xxi, 1897, pp. 35 & 36.
15. —. (2) L'union des cellules néphridiales des Glossiphonides et l'indépendance du prétendu entonnoir des Herpobdellides. T. c. (Mem.) pp. 6–21, pls. i–iv.
16. BORELLI, A. Viaggio del Dr E. Festa nell' Ecuador e regioni vicine. ix, Planarie d' acqua dolce. Boll. Mus. Torino, xiii, No. 322, 6 pp., 2 figg.
17. BRACE, E. M. Notes on *Æolosoma tenebrarum*. P. Amer. Ass. xlvii, Boston, p. 363.
18. BRANDES, G. (1) Die Ursache der Grünfärbung des Darmes von *Chaetopterus*. Zeitschr. Naturw. lxx, pp. 423–428.
19. —. (2) Die Gattung *Gastrothylax*. Abh. Ges. Halle, xxi, pp. 193–225, pls. viii & ix.
Critical abstract, by BRAUN, Zool. Centrbl. 1898, pp. 368–371.
20. —. (3) Das Nervensystem der als Nemathelminthen zusammengefassten Wurmtypen. Abh. Ges. Halle, xxi, pp. 273–299, 11 figg.
To show that the group Nemathelminthes is not a natural group. *Nematoda*, pp. 277 & 291, *Gordiaceæ*, pp. 280 & 292, *Acanthocephala*, pp. 283 & 296, *Chætognatha*, pp. 287 & 297. Résumé of anatomy and histology of the nervous system.
21. BRAUN, M. Bronn's Klassen und Ordnungen des Thierreichs. Bd. iv. Würmer.
Continuation: pts. 56–58, pp. 1535–1614, pl. lix.

22. BRISTOL, L. C. The Metamerism of *Nephelis*. A contribution to the morphology of the nervous system with a description of *Nephelis lateralis*. J. Morphol. xv, pp. 17-72, pls. iv-viii.
Full paper of which preliminary notice recorded last year. Abstract, Zool. Centrbl. vi, pp. 285-289, 1 fig.
23. BRODE, H. S. A contribution to the morphology of *Dero vaga*. J. Morphol. xiv, pp. 141-180, pls. xiii-xv.
24. BROWN, A. W. On *Tetracotyle petromyzontis*, a parasite of the brain of *Ammocetes*. Quart. J. Mic. Soc. xli, pp. 489-498, pl. xxxix.
25. BROWNE, E. T. On the pelagic fauna of Plymouth for September, 1897. J. Mar. Biol. Ass. (n. s.), v, pp. 186-192.
26. BRUMPT, E. Quelques faits relatifs à l'histoire du *Phascolion strombi* (Montague). Arch. Zool. exp. v, 1897, pp. 483-496, 4 figg.
27. *BRUSINA, S. Metilj = *Distomum hepaticum* (L.). Glasnik. Naravosl. druzt. x, pp. 227 & 228.
28. BÜRGER, O. Bronn's Klassen und Ordnungen des Thierreichs, iv, Würmer, Suppl. Nemertini (Schnurwürmer), pp. 65-240, pls. v-xi, and several figg. in text.
29. CAMERANO, L. Gordiens du Mexique. Bull. Soc. zool. France, xxiii, pp. 73-76.
30. CAMPAGNA, F. Elenco di alcuni animali pelagici raccolti nel golfo di Palermo. Natural. Sicil. (n. s.) ii, pp. 177-181.
31. CARNOY, J. B. A propos de fécondation. Réponse à v. Erlanger und Flemming. Cellule, xiv, pp. 1-25.
Of *Ascaris*.
32. CAULLERY, M. & MÉSNIL, F. (1) Sur une grégarine cœlomique représentant, dans son cycle évolutif, une phase de multiplication asporulée. C.R. Ac. Sci. cxxvi, pp. 262-264, and C.R. Soc. Biol. v, pp. 65-68.
33. — & —. (2) Sur un Sporozoaire aberrant (*Siedleckia*, n. g.). C.R. Soc. Biol. v, pp. 1093-1096, 6 figg.
— [See also MÉSNIL & CAULLERY (178 to 181).
34. CERFONTAINE, P. (1) Contribution à l'étude des Otocotylides. iv. Nouvelles observations sur le genre *Dactylocotyle* et description du *Dactylocotyle lusœ*. Arch. de Biol. xv, pp. 301-328, pl. xii, and 2 figg. in text.
35. —. (2) Le genre *Merizocotyle* (Cerf.). T. c. pp. 329-366, pls. xiii & xiv.
36. CHATIN, J. Sur les noyaux hypodermiques des Anguillulides. C.R. Ac. Sci. cxxv (1897), pp. 57-59.
37. CHILD, C. M. The axes of the Annelid Egg. Univ. Rec. iii, p. 99.
38. CHOLODKOWSKY, N. A. (1) O sistematičeskom položeniī skrebnei (*Acanthocephali*). [On the systematic position of the *Acanthocephali*.] Trudui St. Peterb. Obshch. xxviii, 1897, pp. 14-20. German abstract, p. 47.
39. —. (2) Onyekotornikh ryedkikh parazitakh chelovyeka. [On some rare parasites of man.] T. c. pp. 185 & 186. German abstract, p. 187. Also in Arch. parasit. i, pp. 354 & 355.

40. COBB, N. A. (1) Extract from MS. Report on the Parasites of Stock. Agric. Gaz. N.S.W. ix, pp. 296–321, and pp. 419–454, 127 figg. in text. Account of anatomy of nematodes introducing the names of several new genera and species which are figured but not diagnosed.
41. —. (2) Australian free-living marine nematodes. P. Linn. Soc. N. S. Wales, xxiii, pp. 383–411.
42. COHN, L. (1) Zur Anatomie der *Amabilia lamelligera* (Owen). Vorl. Mitth. Zool. Anz. xxi, pp. 557–562, 3 figg.
43. —. (2) Untersuchungen über das centrale Nervensystem der Cestoden. Zool. Jahrb. Anat. xii, pp. 89–160, pls. vi–ix, and 9 figg. in text. (Abstract, Zool. Centrbl. vi, pp. 123–125).
- COLLIN, A. [See KRÄMER (141).]
44. CONDORELLI-FRANCAVIGLIA, M. (1) Alcuni casi di omopolielmintiasi e brevi considerazioni sul parassitismo negli animali in vita libera. Boll. Soc. Rom. Zool. vi (1897), pp. 68–78.
45. —. (2) Elminti trovati in un *Hydrocolæus minutus*. T. c. pp. 118–124.
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II. BIOLOGY.

[OF ANNELIDES, PLATYHELMINTHES AND NEMATHELMINTHES.]

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Supplement to Bibliography of clinical helminthology (Nematodes); HUBER (2).

A case of *Oxyuris vermicularis* mistaken for an *Ankylostoma*; HUBER (2).—*Ankylostomum duodenale*, its geographical distribution and significance in pathology; ZINN & JACOBI.

The blood-*filariæ*: MANSON (2).—Therabentine as a cure for bronchitis caused by *Strongylus apri*; GALLI-VALERIO (1, iii).—Thymol as a cure for *Sclerostoma* in horse; THEOBALD.—Trichinosis; REEKER.—Uncinariosis; GALLI-VALERIO (2, ii).

An unknown parasite causing brain- and liver-disease in Japan; KANAMORI.

Cure for plants ravaged by *Tylenchus devastrix*; KÜHN.

CLASSIFICATION, NOMENCLATURE, &C.

Genealogical tree of the *Ichthyobdellidæ*; JOHANSSON (2).—Railliet's new classification and nomenclature of the parasitic worms of man and the domestic animals; GALLI-VALERIO (3).—Criticism of nomenclature of Cestodes employed in Bronn's Thierreich; BLANCHARD.—Position of the *Tetrarhynchidæ*; VAULLEGEARD.—A new family of Cestodes; WOLF-HÜGEL (2).

List of monogenetic trematodes, with synonyms; SAINT-RÉMY.—Genera and subgenera of *Fasciolida*, with their type species, and analytical key; STILES & HASSALL (2).

The group Nemathelminthes thought not to be a natural group, judging from the nervous systems of the different groups comprised in it; BRANDES (3).—Independence of *Acanthocephala* and Nematodes, relationship of the former to Cestodes; CHOLODKOWSKY.

Corrections, or confirmation, of Beddard's identifications of some of Schmarda's Oligochætes; MICHAELSEN (2).

HABITS, &c.

The appearance of "Palolo" only on the day before the last quarter of the moon in October or November, or in both, and its continuance for 2 days only, established as a fact; FRIEDLÄNDER.

Habits of 2 varieties of *Arenicola marina*; GAMBLE & ASHWORTH.

Association of structure of earthworms with their habits; RIBACOURT.

—Their value in agriculture; RIBACOURT; WOOLNEY.

Habits and seasonal changes of *Alma nilotica*; MICHAELSEN (1).

Habits of *Clepsine costata*; KOWALEWSKY, A.: of *Pontobdella muricata*; GIBBS: incubation of young; J. Mar. Biol. Soc. v, p. 195.

Vitality of Nematodes as shown by their being able to live for 14 days after treatment with osmic acid and being mounted as microscopical preparations; FRITSCH.

PARASITES.

Of *Gephyrea*:—a new holotrichous infusorian in *Phascolosoma*; FLOR-ENTIN.—Infusoria in *Sipunculus*; MÉTALNIKOFF.—A bryozoon on integument of, and a *Syllis* sharing the Gastropod shell with, *Phascolion*; BRUMPT.

Of *Polychæta*:—a *Distomum* and a new species of gregarine (*Urospora*) in *Lagis koreni*; SAINT-JOSEPH, p. 149: gregarines of *Clymenella torquata* and *Rhynchobolus americanus*; PORTER: a gregarine capable of multiplying otherwise than by spores in *Dodecaceria*; CAULLERY & MÉSNIL (1): also gregarines in *Heterocirrus* and *Tharyx*; MÉSNIL & CAULLERY (1), pp. 122, 126: an aberrant sporozoon in *Scoloplos*; MÉSNIL & CAULLERY (2).

Of *Oligochæta*:—a new sporozoon in *Limnodrilus*; MRÁZEK (1): a large number of nematodes in a n. sp. of *Callidrilus*; MICHAELSEN (1).

[See also under "Body Cavity," &c., and under "Digestive System."]

METHODS.

For removing the cuticle of Polychætes; LEWIS (2).

For nervous system: of Polychætes—application of Ehrlich's method; GAMBLE: of leeches, Golgi's method for nerve-endings; RETZIUS; SOUTKATSCHOFF: Thanhoffer-Löwit method for nerve-endings in muscle cells; CSIKY.

Staining of the nuclei of the gut-wall during life by means of carmine in sea water; PICTON (1), p. 296.

Methods for fixing eggs of *Allolobophora*; FOOT & STROBELL.

III. DISTRIBUTION.

[OF ANNELIDES, PLATYHELMINTHES AND NEMATHELMINTHES.]

1. GEOGRAPHICAL.

(a) MARINE FORMS.

Arctic Ocean.

White Sea: List of Polychætes (47 spp.), Gephyreans (3 spp.), Turbellarians (42 spp.), and Nemertines (18 spp.), a *Sagitta*, and a *Dinophilus*; PEDASCHENKO.

Coast of Greenland, chiefly from B. of Karajak: Polychætes at a depth of less than 100 m. (47 spp.), littoral Oligochætes (2 spp.); MICHAELSEN (4).

N. coast of Scandinavia: *Ichthyobdellidæ*; JOHANSSON (1).

Atlantic Ocean.

Coasts of Ireland: 20 spp. of Nemertines and their distribution; JAMESON (1).

Loch Fyne: 221 spp. "Vermes" (and 3 parasitic ones); SCOTT (2).

Firth of Forth: *Sagitta* and its parasites; SCOTT (1).

Coasts of Norway and Sweden: *Ichthyobdellidæ*; JOHANSSON (1).—Skagerak: annelid larvæ and *Chaetognatha* from different localities at different seasons; AURIVILLIUS.—*Tomopteris septentrionalis*, Stenstrup, and *Spadella hamata*, Möbius, on Norwegian coast; NORDGAARD.

North Sea: Borkum and neighbouring islands, 2 spp. Polychætes, 4 leeches, 1 Turbellarian, and a Cestode of the eel; SCHNEIDER.

English Channel: Falmouth: Polychætes and Nemertines, their fluctuations in different years; VALENTIN.—Coast of Brittany: Polychætes; SAINT-JOSEPH.—Comparison of Fauna with that of Gulf of Lyons, 200 spp. Polychætes, 4 Gephyreans, 28 Nemertines, and 5 Turbellarians common to both localities, 120 Polychætes, 8 Nemertines, and 3 Turbellarians being peculiar to the channel, the horizons and localities of all; PRUVOT (1) & (2).—Turbellarians of Bay of Concarneau, 29 spp., 5 new.—Comparison with the spp. of the Boulonaise; FUHRMANN (2) & (4).

West Coast of France: List of Polychætes and their geographical distribution; SAINT-JOSEPH, pp. 447–449.—Two spp. *Protodrilus*, and 1 of *Boccardia* (from brackish water), from the Loire Inférieure; FERRONNIÈRE.

Mediterranean: Gulf of Lyons,—comparison of Fauna with that of Coast of Brittany, 130 spp. Polychætes, 4 Gephyreans, 16 Nemertines, and 6 Turbellarians occurring there which do not occur in Brittany; PRUVOT (1) & (2).—G. of Palermo: 4 Polychætes, *Saccocirrus*, 2 *Chaetognatha*, and larvæ of Polychætes, Nemertines and Polyclads, all pelagic; CAMPAGNA.—Parasites of fish of Triest and neighbourhood; STOSSICH.

N. Tropical Atlantic: 14 spp. Polychætes (7 new): 7 spp. Gephyreans (5 n. varr.); ROULE (1) & (2) resp.

Tropical Atlantic: Coast of S. America and of Africa, Cape Verde Islands and northward to Bermudas and Newfoundland: Polychæte- and Gephyrean-larvæ; HÄCKER (1) & (2). W. coast of Africa: *Glyceridæ*; ARWIDSSON.

Indian Ocean.

Red Sea: pelagic and larval Polychætes, *Sagitta*, Turbellarians; STEUER. *Glyceridæ*; ARWIDSSON.

Pacific Ocean.

Coast of Japan: brackish-water Oligochæt; JIZUKA.

Coasts of Australia: free-living Nematodes; COBB (2).—Gt. Barrier Reef: Planarians; WOODWORTH (2).—Malay Archipelago: a new sp. of *Aspidosiphon* near Kisser I.; HORST (1): a n. sp. of *Sipunculus* near Billiton I.; SLUITER.

Ternate: 2 spp. Polyclads (1 new); PLEHN.

Funafuti; Polychætes (4 spp.), and Gephyreans (5 spp.); WHITELEGGE.—Gephyreans; SHIPLEY (1).

Rotuma: Gephyreans; SHIPLEY (1).

Samoa Is.: Plankton; KRÄMER.—“Palolo”; KRÄMER, FRIEDLÄNDER.

E. Pacific Ocean: Coast of California: 18 spp. Polychætes from shallow water, 13 new and 2 n. gg.; JOHNSON. Coasts of Chili and Patagonia: n. spp. of *Glyceridæ*; ARWIDSSON.

Southern Oceans.

S. Africa: E. coast: Gephyreans (14 spp.); SLUITER.

Falkland Is.: Polychætes (5 spp.), and a Gephyrean; PRATT, E. M.

(b) LAND AND FRESH-WATER FORMS.

Palæarctic Region.

Islands of Arctic Ocean: fresh-water fauna; RICHARD.—White Sea: 5 spp. littoral *Enchytræidæ*, 1 new; OBNORSKY. [See also PEDASCHENKO.]

Finnland: a n. sp. Oligochæt from L. Nurmijärvi; STENROOS.

Sweden: fish-leeches of inland waters; JOHANSSON (1).

Borkum and neighbouring islands: 9 spp. terrestrial, and 4 fresh-water Oligochæt, and 4 spp. leeches; SCHNEIDER.

Ireland: fresh-water leeches; SCHARFF.—Earthworms; FRIEND.

France: fresh-water nemertines at mouth of the Loire; FERRONNIÈRE.

Switzerland: new Turbellarians; VOLZ (1).

Austro-Hungary: nematodes of L. Balaton, 14 spp. aquatic, 9 in damp earth, 17 in both, 18 spp. peculiar to the Lake; DADAY (2).—10 spp. Leeches and 11 spp. Oligochæt of L. Balaton; VANGEL, see Zool. Rec. for 1897, Vermes, p. 18.—Parasites of animals about Triest; STOSSICH.

Roumania: earthworms; ROSA (4), JACQUET.

Barbary: parasites; LÜHE (1).

Japan: new earthworms (*Perichæta*); GOTO & HATAI, HORST (3). A n. sp. of littoral oligochæt; JIZUKA.

Oriental Region.

India: earthworms, 4 spp. (3 new); FEDARB.

Ceylon: earthworms, 37 spp.; MICHAELSEN (2).—Fresh-water nematode; DADAY (1).

Siam: earthworm; ROSA (3).

Sumatra, Mentawai and Engano: Parasites; PARONA.

Indo-Malay Region: land-planarians, 94 spp. (9 new), 40 of them in Java and 21 in Celebes, the region as the home of *Bipalium* and *Placocephalus*; v. GRAAF.

Christmas I.: 2 new spp. earthworms; ROSA (3).

Australian Region.

New Guinea: resemblance of earthworm-fauna to that of Oriental rather than to that of Australian Region, 6 spp. (2 new); ROSA (2); 1 sp. earthworm; FLETCHER.

Bismark Archipelago: Nemathelminthes; v. LINSTOW (1).

Timor: 2 spp. *Perichæta*; ROSA (2).

Australia: Nemathelminthes; v. LINSTOW (2).—Nematodes of stock; COBB (1).—A land leech; LAMBERT.

Fiji Is.: a new nematode, parasitic in *Julus*; GILSON (2).

Funafuti: 2 spp. *Perichæta*; WHITELEGGE.

Ethiopian Region.

Africa: earthworms and fresh-water worms, the region as the home of the *Eudrilinæ* and the *Benhamini*, and of *Callidrilus*, the occurrence there of *Glyphidrilus*, which was only known from Burmah and Malay before; resemblance of terrestrial forms of Sahara and Egypt to European ones, of fresh-water forms of the Nile and Egypt to Tropical African ones; MICHAELSEN (1).—Parasites; SONSINO.

Cape Colony: new sp. and new var. of *Microchæta*; ROSA (5).

Neotropical Region.

Chili: earthworms, 4 spp., 2 new and some imported ones; MICHAELSEN (3).

Paramaribo: a sp. of *Perichæta* only known to occur in Madagascar and the Philippines before; HORST (2).

Ecuador: a n. sp. and a new var. of *Planaria*; BORELLI.

Isthmus of Panama: earthworms, 3 spp.; ROSA (3).

Mexico: *Gordiidae*, 4 spp. (2 new); CAMERANO.

Nearctic Region.

N. of Mexico, chiefly California: *Gordiidae*, 18 American spp. recognised, key to them; MONTGOMERY (1).

United States: Oligochætes of genus *Diplocardia*; EISEN.

Illinois: turbellarians; WOODWORTH (1).

L. Chautauqua: trematodes parasitic on *Unionidae*, one of them belonging to a genus only known in Senegal before; OSBORN (1) & (2).

2. GEOLOGICAL.

Nothing to record.

3. IN OR ON OTHER ANIMALS.

GENERAL.

Influence of parasitism in wild animals; CONDORELLI FRANCAVIGLIA (1).

Table of species of monogenetic trematodes and of their hosts; SAINT-RÉMY.

List of parasites in the patho-biological Laboratory, Nebraska; WARD (2).

Helminthological fauna of Triest and neighbourhood: 309 spp. of parasites occurring in 174 Vertebrate hosts and 2 Crustacean hosts, land, fresh-water and marine spp.; STOSSICH.

Helminthological fauna of Egypt, comparison with that in other parts of Africa, including an historical account; SONSINO. [See also LOOSS (1).]

Vertebrates of E. Prussia: 70 spp. Trematodes, 74 Cestodes, 8 Nematodes, and 21 Acanthocephala; MÜHLING (2).—Vertebrates and invertebrates of Sumatra, Mentawai and Engano: 3 spp. Cestodes, 85 Nematodes, and 1 *Echinorhynchus*; PARONA.

Mammals.

In Man.—New edition of TREILLE's book on intestinal worms (303). A case of *Distomum felineum* Riv. in the liver; CHOŁODKOWSKY (2). Life-history of *Anchylostomum duodenale*; LEICHTENSTERN (1) & (3), LOOSS (3). Filariæ of man; MANSON; STILES (44). Human parasites in Sumatra, &c.; PARONA. [See also under "Medical Notes," p. 28.]

In other Mammals.—Parasites of 23 spp. in E. Prussia; MÜHLING (2). Trematodes and Cestodes of animals used for food, with key for determination of species; STILES & HASSALL (2). Nematodes of Australian Stock; COBB (1). Parasites of cattle in Russia; GURIN. Trematodes of Oxen in Tonkin; GIARD & BILLET; of oxen and buffaloes in Cochinchina; RAILLIET & MAROTEL. Horse: case of an extraordinary number of Ascarids; VALENTINI (1 & 2): 2 spp. of *Sclerostomum*: *Ankylostomum* of man not causing disease; RATZ (1) & (2): 3 spp. of *Sclerostomum*, their destruction by thymol; THEOBALD: 2 cases of liver-fluke in foals; SAUER.—Hybrid between Zebra and Iceland pony: *Sclerostomum equinum* O. F. M., Arch. parasit. i, p. 629. Sheep: *Cysticercus tenuicollis* in heart; RAILLIET. In *Mustela foina*: *Filaria quadrispina* Dies.; CONDORELLI-FRANCAVIGLIA (3). Hyrax: Cestode parasites; SETTI. Rodents: Cestodes; STILES & HASSALL (347), CONDORELLI-FRANCAVIGLIA (3). In *Mus*: of E. Ind. Archipel., 2 parasites; PARONA: of Brazil, one (a *Gigantorhynchus*); MAGALHÃES. Dogs and Cats: of Nebraska, the percentage of dogs infested with the different parasites compared with that in other parts of the world; WARD (1).—*Eustrongylus gigas* in dogs of Warsaw, percentage infested at different seasons; ROTSTADT.—Case of an *Uncinaria* in cat; GALLI-VALERIO (2, ii): of *Dipylidium caninum*; CONDORELLI-FRANCAVIGLIA (3). 2 new cestodes in civet-cat; LÜHE (1, ii). *Procyon syriaca*: endoparasites; NASSONOW (4). Bats: the 4 spp. of *Distomum* in Egyptian bats; LOOSS (2).

Birds.

Parasites of 81 spp. in East Prussia; MÜHLING. Distribution of *Bilharzia polonica* in birds; KOWALEWSKI, M. (3, iii). Parasites of birds of Bismarck Archipelago; v. LINSTOW (1): of birds of Sumatra, &c.; PARONA. The Nematodes of birds, 24 spp., their distribution in 32 spp. birds, new hosts for 9 spp.; VOLZ (2). Note on parasites of birds; NEWMAN. Two new cestodes of fowl; MAGALHÃES (No. 8): cestodes of Nebraska chickens, comparison with those of neighbouring states; WARD (3). *Syngamus trachealis* in goose; RAILLIET (1): not in duck; RAILLIET (2). A leech, causing disease in geese; RAILLIET (3). A n. sp. of *Distomum* in wild duck; GALLI-VALERIO (4). *Distomum* of gull; JÄGERSKIÖLD (1). Endoparasites of the Flamingo, including 2 new cestodes; LÜHE (1, i). Birds of prey of Roman provinces: 9 Nematodes, 3 Cestodes, 13 Acanthocephala; LEPRI. *Fulica atra* L.: *T. (Hymenolepis) inflata* Rud.; JACOBI. *Himantopus candidus*: a case of *Tenia mediocanellata*; LEO-

NARDI, TOROSI. *Hydrocolæus minutus*: a *Tenia*, a *Distomum* and an *Echinostomum*; CONDORELLI-FRANCAVIGLIA (2). *Botaurus minutus*, Boie: rediscovery of *Echinostomum spathulatum*, Rud., in; KOWALEWSKI, M. Jay: occurrence of *Monostomum faba*; RAILLIET (4). King-fisher: a *Hemistoma* and its life-history; VILLOT (1).

Reptiles.

Parasites of 5 spp. in E. Prussia; MÜHLING (2): of 2 spp. in the Bismarck Archipelago (Nematodes); v. LINSTOW (1): of 3 spp. in Sumatra, &c.; PARONA. Cestodes of Lizards and Snakes; LÜHE (3). *Varanus*: a new cestode; RIGGENBACH: ascarids; PARONA. *Bothrops*: of Martinique, a cestode; MAROTEL. Fresh-water tortoise of S. Brazil: *Temnocephala brevicornis*, Mont.; MONTICELLI.—*Clepsine* on tortoises; KOWALEWSKY, A.—*Rhabdonema* from lung of tortoise; ASKANAZY.

Amphibians.

Parasites of 5 spp. in E. Prussia; MÜHLING (2): of 1 in Bismarck Archipelago; v. LINSTOW (1). Frog: in Eye, *Diplostomum rhachiacum*; HEALE: in lung, *Ascaris nigrovenosa*; NEDKOFF: a *Distomum* producing white tubercles in lung (of *R. esculenta*); GALLI-VALERIO (2): a *Distomum* producing, when encysted, tumors near pylorus; WAGNER (described, but mistaken for Protozoa, by GEBHARDT): spp. of *Schistocephalus* and *Echinorhynchus*, in *R. esculenta*; MÜHLING (1).—American Frog (*R. clamata*): *Distomum ovocaudatum* in eustachian tubes; NICKERSON.

Fish.

Parasitic worms of fish and their vitality; RATTRAY. Trematode parasites of American fish; LINTON. Parasites of 34 spp. of fish in E. Prussia; MÜHLING (2). Parasites of 9 spp. fish of Roman Provinces (4 Cest., 7 Nemat., 1 Trem., 2 Echinorh.); CONDORELLI-FRANCAVIGLIA (5). In eyes of fish, especially of salmon, *Diplostomum volens*; HOFER (2). Other parasites of American salmon; HOFER (1). Perches of Italian Lakes: percentage in different Lakes infested with *Tetracotyle*, influence of parasite on its host; PIANA. Parasites of *Gobius avernensis* (2 Cest., 1 Trem., 3 Nemat., and 4 Acanthoc.); CONDORELLI-FRANCAVIGLIA (4). A new sp. of Trematode (*Octoplectanum*) on the flounder; LINTON. *Phoxinus laevis*: as intermediate host for *Hemistoma* of King-fisher; VILLOT (1). Cestode of Eel; SCHNEIDER. A n. sp. of *Ichthyonema* in *Accipenser sturio*; DEL LUPO. *Chlamydoselachus anguineus*: a new cestode and a trematode; LÖNNBERG (2). In *Raja clavata*, bile ducts and liver: adult of *Stichocotyle nephropis* found; ODHNER. *Isurus cornubicus*: 3 spp. of Cestodes; LÖNNBERG (1).

On the branchiæ of *Tetrapturus belone*: a n. sp. of *Tristomum*; SETTI (2). Species of *Dactylocotyle* living each on a special gill-bar of their host; CERFONTAINE (1).

Cyclostoma.

On lips of adult *Petromyzon*: a n. sp. of leech; MOORE.

In *Ammocætes*: *Tetracotyle petromyzontis*, in brain; BROWN, A. W.: a n. sp. of *Oxyurus* and embryos of *Gordius aquaticus*; v. LINSTOW (3).

In *Myxine glutinosa*: *Ascaris*-larva forming cyst in walls of alimentary canal: v. LINSTOW (3).

Arthropods.

Insecta: Hosts of larva of *Gordius aquaticus* L., 11 spp. locusts, 6 beetles, 3 water-beetles: of larva of *Gordius tolosanus* Duj., 21 spp. beetles, 1 water-beetle, and 1 Phryganid: of embryo of *Gordius tolosanus*, the larvæ of *Sialis* and *Cloëon*; v. LINSTOW (3). *Periplaneta americana* as intermediate host of *Gigantorhynchus moniliformis* Bremser; MAGALHÃES (No. 7).

Myriapoda: 5 spp. of Nematodes in Diplopods of Sumatra, Engano or Mentawai; PARONA. A new genus of Nematode parasitic on *Julus solomoniensis* from the Fiji Is.; GILSON (2).

Crustacea: *Asellus aquaticus* with a n. sp. of *Mesostoma* parasitic on or symbiotic with it; KENNEL. The *Stichocotyle* of *Nephrops*, life history; ODHNER. Larva of *Coronilla robusta* in *Portunus depurator*; VAULLEGEARD (2, i). Parasites of *Calanus* of Loch Fyne; SCOTT (2). Ectoparasitic on *Cambarus digueti*: a *Branchiobdella*, and a *Temnocephala*; VAYSSIÈRE.

Molluscs.

A *Distomum* in the alimentary canal of *Sepia*; a peculiar *Cercaria* in *Natica*; VAULLEGEARD (2, iii & ii, resp.). *Conchosomum* as the probable intermediate host of *Tetracotyle percae fluviatilis*; PIANA. A n. sp. of *Polynoë* between mantle-flap and foot of *Lucapina crenulata*; JOHNSON, p. 178. A *Distomid* parasitic on *Anodon* of L. Chautauqua, causing discoloration of shell; OSBORN (1). *Platyaspis* parasitic on *Anodon* (only known from Chelonians before); OSBORN (2).

“*Vermes.*”

Phascolion: A *Syllis* living with it and a *Loxosoma* on its integument; BRUMPT.

Amphitrite: 2 n. spp. of *Polynoë* commensal with it, on Californian Coast; JOHNSON.

A n. sp. of *Callidrilus* infested with Nematodes; MICHAELSEN (1). *Limnodrilus*: a new sporozoon; MRÁZEK.

Sagitta: A nematode and a distomid parasitic in it; SCOTT (1).

Echinoderma.

Asterias: with *Polynoë fragilis* (Baird)? living on it; JOHNSON, p. 180. *Holothuria californica*: with a n. sp. of *Polynoë* living on it or in its mouth; JOHNSON, p. 177.

Hydrozoa.

Peculiar Trematode larva in medusæ; VALENTIN.

Plants.

List of plants on which *Heterodera schachtii* found in Russia, *Dorylaimus* and *Enchytraeus* the only genera that occur in beet-root there and then not in sufficient quantity to do harm; TARNANI; criticised by HOLLRUNG. Nematodes of the coffee-root; ZIMMERMANN. Grass and celery in Australia: nematodes; COBB (2). An oligochæt living in the urns of *Utricularia neglecta*; GARBINI.

IV. SYSTEMATIC.

ANNELIDA.

A. *GEPHYREA*.a. *INERMIA*.

Aspidosiphon cylindricus, n. sp., off coast of Kisser I. (near Timor, Malay Archipel.); HORST, Notes Leyd. Mus. xx, p. 195.

A. elegans, Ch. & Ey., and *A. steenstrupii*, (Dies.) Sel., at Funafuti; SHIPLEY; WHITELEGGE.

"*Baccaria*," new type of larva with *B. citrinella*, *B. oliva* and *B. pirum*, n. larval spp.; HACKER (2), p. 33.

Clæosiphon aspergillum, Qfg., at Funafuti; SHIPLEY; WHITELEGGE.

Phascolion strombi, Mont., at Roscoff, experiments on excretion; BRUMPT.

Phascolosoma, 5 n. varr. in subtropical N. Atlantic, 3 of them leading on to *Aspidosiphon*; ROULE. Larvæ; HACKER (2), p. 35.

Physcosoma, objection to the name; SPENGEL. *P. varians*, Kef., in the Pacific (Funafuti), and 5 other spp. at Funafuti and Rotuma; SHIPLEY, P. Z. S. p. 471.

Sipunculus funafuti, n. sp., Funafuti, *S. rotumanis*, n. sp., Rotuma, and *S. vastus*, Sel. & Bülow, from both localities; SHIPLEY, P. Z. S. p. 469.

S. discrepans, n. sp., for "*S. indicus* Pet." Sluiter, from Billiton I. (Malay Archipelago), anatomy; SLUITER, Zool. Jahrb. Syst. xi, p. 445.

S. nudus, excretory organs; MÉTALNIKOFF. Larvæ; HACKER (2), p. 33.

b. *ARMATA*.

(*Holothuridium*) *papillosum*, D. Ch., referred to the genus *Thalassema*; JAMESON (2).

Thalassema papillosum, D. Ch., of Mediterranean, description and diagnosis of sp., affinities to *T. diaphanes*, Sl., of Bay of Batavia; JAMESON (2).

T. 2 spp. from Rotuma; SHIPLEY, p. 472.

B. *CHÆTOPODA*.a. *POLYCHÆTA*.

Acrocirrus, distinction of genus from *Macrochæta*; MÉSNIL & CAULLERY (1), p. 112.

Amphictenidæ, cardiac body and coelomic fluid; PICTON (1); SCHNEIDER.

Amphitrite johnstoni, Mgr., at Croisic, description; SAINT-JOSEPH, p. 421.

Antinoë, Kbg., = *Harmothoë*, Kbg. (s. ext.); JOHNSON, p. 165.

Aphrodite perarmata, n. sp., Las Pilonas, at a depth of 640 m.; ROULE, Bull. Mus. Paris, 1898, p. 190.

Aphroditella pallida, n. sp., off C. Spatel, at a depth of 1084 m.; ROULE, l. c. p. 191.

Apisthobranchidæ, n. fam., for the genus *Apisthobranchus*, Theel, the characters distinguishing it from the *Ariciadæ*. Identity of *A. tullbergi*, Theel, with *Ethocles typicus*, Webst. & Ben.; MÉSNIL & CAULLERY, Bull. Sci. France Belgique, xxxi, p. 146.

(*Archidice*) *glandularis*, Lngghs., = *Cirratus glandularis*; MÉSNIL & CAULLERY, Ann. Univ. Lyon, xxxix, p. 110.

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- B. affinis*, Mehlsn., *B. annæ*, Horst, *B. bolavi*, Mehlsn., in Africa; MICHAELSEN, l. c. pp. 13–18.
- Büttneriodrilus*, n. g. of *Eudrilini*, with *B. conigicus*, n. sp.; MICHAELSEN, Jahrb. Hamburg. Anst. xiv (2), p. 42.
- Callidrilus dandaniensis*, n. sp., German E. Africa, its infestation with nematodes; MICHAELSEN, Jahrb. Hamburg. Anst. xiv (2), p. 57.

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- P. lorice*, n. sp., *P. papua*, n. sp., and *P. neoguinensis*, Mchlsn. var. *spectabilis*, n. var., and 2 undetermined spp., British New Guinea; ROSA, Ann. Mus. Genov. xix.
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D. clathratum, Desl., *D. concavum*, Crepl., *D. crassiusculum*, Rud.,

D. lingua, Crepl., *D. mentolatum*, Rud., amended descriptions; and identity of (*D. tenuecolle*, Rud.) with *D. felineum*, Riv.; MÜHLING, Arch. Naturg. lxiv, pp. 80–89, 94.

D. lingua, Crepl. (and Olsson), detailed description, especially of the genital apparatus and sucker; the sp. distinguished from *D. lingua*, Mühling, for which the name *D. mühlingi*, n. nom., proposed; JÄGERSKIÖLD, Bergens Mus. Aarbog, 1898, No. 2, p. 7.

D. concavum, Crepl., also with a genital sucker; MÜHLING (1).

D. cylindraceum, Zeder., causing tubercles in lung of frog; GALLI-VALERIO (2), p. 371.

(*D. cælomaticum*, Giard & Billet, 1897), and (*D. pancreaticum*, Janson, 1897), referred to genus *Dicrocoelium*, RAILLIET & MAROTEL.

D. ascidia, *D. ascidoïdes*, and their allies; LOOSS (2).

A *Distomum* causing discoloration of the shells of *Anodon*; OSBORN (1).

Echinostomum phoenicopteri, n. sp., small intestine of flamingo; LÜHE, Abh. Ak. Berlin, p. 625.

E. spathulatum, Rud., from *Botaurus minutus*, Boié, found again and redescribed; KOWALEWSKI, M. *E. ferox*, Zed., cysts; MÜHLING.

Fasciolidae, list of genera and subgenera; STILES & HASSALL, Arch. parasit. i.

Fasciolinae, n. subfam., for hermaphrodite *Fasciolidae*, *ibid.*, l. c., p. 90.

Gastrothylax, anatomy of genus and of its 5 spp., including *G. compressus*, n. sp., from *Bos indicus*, and *G. spatiosus*, n. sp., from *Bos taurus*?, coast of Red Sea; BRANDES, Abh. Ges. Halle, xxi, pp. 219 & 220.

Hemistomum denticulatum, Rud., of *Alcedo ispida*, the larval form discovered in subcutaneous tumours of *Phoxinus laevis*; VILLOT.

Merizocotyle, diagnosis and affinities of genus, p. 362, and description of *M. minus*, n. sp., p. 357, parasitic on gills of the "Tyregris" (probably = *Raia oxyrhynchus*), Roscoff, and detailed anatomy of *M. diaphanum*, Cerf., p. 330; CERFONTAINE, Arch. Biol. xv.

"Metilj" = *Distomum hepaticum*; BRUSINA.

Monostomum alveatum, Mehlis, from *Fuligula marila*, description and figure; MÜHLING, Zool. Anz. xxi, p. 19, and Arch. Naturg. lxiv, p. 101.

M. attenuatum, Rud., small variety in flamingo; LÜHE (1), p. 625.

M. faba, Bremser, in the jay, France; RAILLIET, Arch. parasit. i, p. 629.

Nitzschia papillosa, n. sp., gills? of *Gadus callarius*; LINTON, P. U. S. Mus. xx, p. 508.

Octoplectanum affine, n. sp., from *Paralichthys dentatus*; LINTON, *t. c.*, p. 511.

Opisthorchis pianæ, n. sp., from intestine of wild duck, Milan; GALLI-VALERIO, Centralbl. Parasit. xxiii, p. 145: referred to *Echinostomum conoideus*, Bl.; KOWALEWSKI (2); but its generic name (at least) justified by GALLI-VALERIO, *op. cit.*, xxiv, p. 923.

O. crassiuscula, Rud., var. *janus*, n. var., gall bladder of duck, *O. simulans*, Looss, var. *poturzyensis*, n. var., bile ducts of duck, *O. xanthostoma*, Crepl.? (Wag.), var. *compascua*, n. var., gall bladder of *Anas querquedula*, L., all? types of n. spp.; KOWALEWSKI, Bull. Ac. Cracovie, p. 71.

(*Platyaspis anodontæ*, n. sp.), in mantle cavity of *Anodon* and *Unio*, L. Chautauqua, the only known representative of the genus before being *P. lenoiri*, Perr., from a chelonian in Africa; OSBORN, Zool. Bull. ii, p. 55; referred to the genus and species *Cotylaspis insignis*, Leidy; KOFOID.

Rhopalias, n. nom., for *Rhopalophorus*, Dies., to distinguish it from *Ropalophorus*, Westw., with *R. (Distom.) coronatum*, Rud., as type; STILES & HASSALL, Arch. parasit. i, p. 93.

Schistosominae, n. subfam. for dioecious *Fasciolidae*; STILES & HASSALL, *l. c.* p. 94.

Stichocotyle nephropis, Cunningh., discovery and description of adult form in Selachean fish, coast of Norway; its distinction from *Macraspis elegans*, Olsson; ODHNER.

Temnocephalidae, fam. divided into 2 subfam., viz.:—*Temnocephalinae* and *Actinodactynellinae*; MONTICELLI.

Temnocephala, the genus divided into 2 groups, the one for the 5 American spp., the other for the 7 Australian and Philippine spp., another sp., *T. axenos* (= *T. chilensis*, Blanch.), being distinct from both.—Anatomy of *T. brevicornis*, Mont.; MONTICELLI, Biol. Soc. Napoli, xii.

T. mexicana, n. sp., on *Cambarus digueti*, Mexico; VAYSSIÈRE, Ann. Fac. Marseille, viii, p. 227.

Tetracotyle petromyzontis, n. sp., for immature Holostomids occurring in brain cavities of *Ammocetes* and probably the same as the forms referred to by Gulliver as "*Neuronaia lampetræ*" in the brain of adult lampreys; BROWN, Quart. J. Micr. Soc. xli, p. 489. *T. percae fluviatilis* (Moul.) and its hosts; PIANA.

Tristomum perugiai, n. sp., gills of *Tetrapturus belone*, Mediterranean; SETTI, Arch. parasit. i, p. 308.

T. papillosum, Dies., new host for; SHIPLEY (3).

Urogonimus rossittensis, n. sp., from bursa Fabricii of *Turdus pilaris*, E. Prussia; MÜHLING, Zool. Anz. xxi, p. 16, & Arch. Naturg. lxiv, p. 100.

Young Forms.

Cercaria ericetorum, n. sp., a tailed form originating in sporocysts, from *Xerophilus ericetorum*, Müll.; v. LINSTOW, Arch. mikr. Anat. li, p. 761.

Diplostomum cuticola, Nordm., shown to be the larva of *Hemistomum denticulatum*, Rud.; VILLOT.

C. NEMERTINEA.

Amphiphorus, 2 n. spp. from White Sea; SABUSSOW.

Cerebratulus, activities of polar bodies; ANDREWS: of mesenchyme cells of larva; WILSON, C. B.

Geonemertes chalicophora, Graf., anatomy and histology; BÖHMIG.

Lineus gesserensis, O. F. M., development; ARNOLD.

Prostoma clepsinoides, Dug., in fresh water near mouth of Loire; FER-
RONNIÈRE.

Stichostemma, diagnosis of 3 spp., and comparison with 2 spp. of *Tetrastemma*: *S. græcense*, anatomy and histology; BÖHMIG.

Tetrastemma, 2 n. spp. from White Sea; SABUSSOW.

D. TURBELLARIA.

("Allostoma durum, n. sp.," Fuhrmann 1896), referred to genus *Mono-*
ophorum; FUHRMANN, Arch. anat. micr. i, p. 469.

Anoplodium chirodotæ, n. sp., White Sea; SABUSSOW.

Artioposthe castanea, n. sp., Philippines; v. GRAAF, Ann. Jard. Bot.
Buitenzorg, Suppl. ii, p. 119.

Bipalium adensameri, *fenestratum*, *haberlandti*, *interruptum*, *jansei*, *lehneri*, *ocellatum*, *robiginosum*, *wiesneri*, *solmsi*, *superbum*, *lomani*, n. spp., Java; *B. claparèdei* and *simplex*, n. spp., Sunda Is. and probably Java; *B. falcatum*, n. sp., E. coast of Sumatra; *B. steindacheri*, n. sp., Malacca; *B. catenatum*, *negritorum*, *semperi* and *tripartitum*, n. spp., Philippines; *B. ranchi* and *ridleyi*, n. spp., Singapore, and *B. strubelli*,

- n. sp., Java and Singapore, and 16 other spp. in the Archipelago; v. GRAFF, *l. c.* pp. 120–125.
- Castrada neocomensis*, n. sp., Neudorf near Basle, and lake near St Blaise (Neufchâtel), and *C. horrida*, O. Schm., var. *viridis*, n. var., Anière, near Geneva; VOLZ, Zool. Anz. xxi, pp. 600, 607.
- Cycloporus papillosus*, fertilisation and segmentation; FRANCOTTE.
- Dendrocœlum lacteum*, CErst., its synonyms and points in its anatomy; WOODWORTH, Bull. Mus. Harvard, xxxi, p. 6.
- Diplopenis*, n. g., of *Mesostomidæ*, for *D. intermedius*, n. sp., Neudorf near Basle, and for *D. tripeti*, n. sp., also in botanic gardens at Geneva and marshes of Hauterive; VOLZ, Zool. Anz. xxi, pp. 610 & 611.
- Diposthidæ*, n. fam., characterised by prostate gland being quite distinct from penis, with *Diposthus*, n. g. for *D. corallicola*, n. sp., under coral rock at Hope I., Great Barrier Reef; WOODWORTH, Bull. Mus. Harvard, xxxii, p. 64.
- Dolichoplana feildeni* (sic), n. sp., Java, Singapore, Ceylon, Cayenne, Barbados; v. GRAFF, Ann. Jard. bot. Buit., suppl. ii, p. 127.
- Geoplana assimilis*, *canaliculata* and *pulverulenta*, n. spp., Philippines; *G. korotneffi* and *krausi*, n. spp., Java; *G. nasuta* (Loman), n. sp., Sumatra; v. GRAFF, *l. c.* p. 110.
- Idioplana*, n. g., of *Planoceridæ*, for *I. australiensis*, n. sp., Hope I., Great Barrier Reef; WOODWORTH, Bull. Mus. Harvard, xxxii, p. 63.
- Macrorhynchus cœruleus*, Fuhrm. 1896, B. of Concarneau and at Villefranche, detailed description; FUHRMANN, Arch. anat. micr. i, p. 476 and Zool. Anz. xxi, p. 255.
- Mesocastrada*, n. g., of *Mesostomidæ*, for *M. fuhrmanni*, n. sp., small pond at Veyrier, near Geneva; VOLZ, Zool. Anz. xxi, p. 606.
- Mesostoma aselli*, n. sp., parasitic in or symbiotic with *Asellus aquaticus*; KENNEL, Zool. Anz. xxi, p. 639.
- (*M. wardii*, Woodw. 1896), = *M. ehrenbergi*, O. Schm., its American representatives; WOODWORTH, Bull. Mus. Harvard, xxxi, p. 11.
- Microstoma lucidum*, Fuhrm. 1896, detailed description; FUHRMANN, Arch. anat. micr. p. 479 and Zool. Anz. xxi, p. 256.
- Monoophorum durum*, for (*Allostoma durum*, Fuhrm. 1896), B. of Concarneau; FUHRMANN, Zool. Anz. xxi, p. 254; Arch. anat. micr. i, p. 469.
- Pelmatoplana bogoriensis* and *treubi*, n. spp., Java, *P. ijimai*, n. sp., Java and Sumatra, *P. inflata*, n. sp., Philippines, and *P. sondaica* (Loman); v. GRAFF, Ann. Jard. bot. Buit., Suppl. ii, p. 119.
- Placocephalus bleekeri* and *mollis*, n. spp., Java, *P. bergendali*, n. sp., Java and Sumatra, *P. virchowii*, n. sp., E. coast of Sumatra, and 5 other spp. in E. Indian Archipelago; v. GRAFF, Ann. Jard. bot. Buit. pp. 120–125.
- Plagiostoma fabrei*, Fuhrm. 1896, I. of Penfort, Glenan Archipelago, p. 459, and *P. violaceum*, Fuhrm. 1896, p. 464, detailed description; FUHRMANN, Arch. anat. micr. i.—The same two spp. in the B. of Concarneau; FUHRMANN, Zool. Anz. xxi, pp. 253 & 254.
- Planaria festæ*, n. sp., and *P. f.*, var. *albolineata*, n. var., Ecuador; BORETTI, Boll. Mus. Torino, xiii, No. 322. *P. dorotocephala*, n. sp., Matanzas Lake, Havana, Illinois, p. 7, and *P. unionicola*, n. sp., on the mantle of *Unio alatus*, deep water, Illinois R., p. 10, and remarks on American representatives of *P. gonocephala*, Dugès, and on *P. maculata*, Leidy, to which v. Duyne's "*P. torva*" is referred; WOODWORTH, Bull. Mus. Harvard, xxxi.
- P. maculata*, regeneration; MORGAN.
- P. torva*, regeneration of nervous system; FLEXNER.—Effect of temperature on regeneration; LILLIE & KNOWLTON.
- Prosthlostomum siphunculus*, fertilisation and regeneration; FRANCOTTE.
- Pseudoceros devisii*, n. sp., Brisbane R., near Brisbane; WOODWORTH, Bull. Mus. Harvard, xxxii, p. 63.

- P. marmoratus*, n. sp. Ternate; PLEHN, Abh. Senckenb. Ges. xxiv, p. 145.
- Rhynchodemus boholicus*, *conspersus*, *cultratus*, *hallezi*, *nolli*, n. spp., Philippines, *R. chuni*, *figdori*, *schmardai* and *varians*, n. spp., Java, *R. vejdoskyi*, n. sp., Java and Singapore, *R. ochroleucus*, n. sp., Java, Philippines, Natuna Is. and Amboina, and *R. leidy*, n. sp., Celebes; v. GRAFF, l. c. pp. 125-127.
- Stenostoma leucops*, O. Schm., notes on the living animal by Kofoid; WOODWORTH, Bull. Mus. Harvard, xxxi, p. 12.
- Thyzanozoon brocchi*, formation of polar bodies; STRICHT.

NEMATHELMINTHES.

A.—NEMATODA and GORDIIDÆ.

(a) NEMATODA, S.S.

- Agamonema stossichii*, n. sp., in *Gobius avernensis*; CONDERELLI-FRANCaviglia, Bull. Soc. Rom. Zool. vii, p. 13.
- Ascaris australis*, n. sp., intestine of *Basa* and *Ninox*, Ralum, and *A. papillifera*, n. sp., from Snakes, Ralum, Bismarck Arch.; v. LINSTOW, Arch. Naturg. 1897, p. 281.
- A. adeline*, n. sp., from *Mugil cephalus*, and 5 other spp. from Mediterranean fish; CONDERELLI-FRANCaviglia, Bull. Soc. Rom. Zool. vii, p. 121.
- A. nigrovenosa*, metamorphosis of genital organs; NEDKOFF.
- A. myxines*, larva from cyst in wall of intestine of *Myxine glutinosa*; v. LINSTOW, Arch. mikr. Anat. li, p. 760.
- A. depressa*, Rud., notes on anatomy; LEPRI, p. 67.
- Alaimus filiformis*, n. sp., L. Balaton; v. DADAY, Erforsch. Balaton See, ii, p. 83.
- Amblyonema*, n. g., for *A. terdentatum*, n. sp., intestine of *Ceratodus forsteri*; v. LINSTOW, Denk. Ges. Jena, viii, p. 470.
- Anchylostomum criniforme* (Goeze), amended description and diagnosis out of a letter from v. Linstow; MÜHLING, Arch. Naturg. lxiv, p. 108.
- Ancyracanthus ophthalmicus*, n. sp., eye of *Carpophaga brenchleyi*, Gray, Ralum, Bismarck Arch.; v. LINSTOW, Arch. Naturg. 1897, p. 285.
- Anticoma lata*, *A. similis*, and *A. trichura*, n. spp., in sand, near low-tide mark, Port Jackson; COBB, P. Linn. Soc. N. S. Wales, xxiii, pp. 383-385.
- Aphanolaimus aquaticus*, n. sp., L. Balaton; v. DADAY (2), p. 84.
- Carnoia*, n. g., of *Oxyuridæ*, for *C. vitiensis*, n. sp., parasitic in *Julus solomonensis*, Fiji Islands; GILSON, Cellule, xiv, p. 360.
- Cephalobus loczyi*, n. sp., L. Balaton, p. 101, and *C. stagnalis*, n. sp., Small L. Balaton, p. 112, and 2 other spp.; v. DADAY (2), p. 101.
- Chromadora balatonica*, *bathybia*, and *bulbosa*, n. spp., L. Balaton; v. DADAY (2), p. 91.
- Cloacina*, n. g., of *Secernentes*, with *C. dahli*, n. sp., al. can. of *Macropus browni* Rams, Ralum, Bismarck Arch.; v. LINSTOW, Arch. Naturg. 1897, p. 286.
- Comeosoma heterura*, n. sp., in sand, 4-5 fathoms, *C. jubata*, and *C. similis*, n. spp., sand near low-tide mark, all at Port Jackson; COBB, P. Linn. Soc. N. S. Wales, xxiii, pp. 385-390.
- Cyatholaimus brevicollis*, n. sp., ♂ only, p. 403, *C. exilis*, n. sp., p. 400, *C. heterurus*, n. sp., p. 400, and *C. trichurus*, n. sp., p. 398, 2 of them

- possibly types of new genera, sea sand near low-tide mark, Port Jackson, and *C. minor*, n. sp., ♂ only, p. 402, sand at bottom of Port Jackson; COBB, P. Linn. Soc. N. S. Wales, xxiii.
- Desmolaimus balatonicus*, n. sp., L. Balaton; v. DADAY (2), p. 90.
- Dispharagus involutus laticeps*, Rud., notes on anatomy; LEPRI, p. 58.
- Diplogaster lacustris*, n. sp., L. Balaton, and another sp.; v. DADAY (2), pp. 99 & 111.
- Dorylaimus striatus*, n. sp., p. 108, and *D. bastiani*, Butschli, var. *longicaudatus*, n. var., and 9 other spp., L. Balaton; v. DADAY (2), p. 105.
- Echinonema*, n. g., with *E. cinctum*, n. sp.; v. LINSTOW, Denk. Ges. Jena, viii, fide J. R. Micr. Soc. 1899, p. 38.
- Eustrongylus gigas*, in dogs; ROTSTADT.—A *Filaria* mistaken for it probably; STILES.
- Filaria*, bibliography of genus; HUBER.
- F. carruccioi*, n. sp., in *Gobius avernensis*; CONDORELLI-FRANCaviglia, Bull. Soc. Rom. Zool. vii, p. 14.
- F. dentifera*, n. sp., from body cavity of *Trichiurus*, Australia; v. LINSTOW, Denk. Ges. Jena, viii, p. 469.
- F. demarquayi*, 'n. sp.,' in blood of natives of some of W. Indian Islands and New Guinea, *F. ozzardi*, 'n. sp.,' in blood of natives of British Guiana, and *F. magalhæsi*, 'n. sp.,' = *F. bancrofti*, Magal. (v. Linstow); MANSON (2), [none of the spp. recognised as new by v. Linstow, Zool. Centrbl. vi, p. 57].
- F. hepatica*, n. sp., bile ducts of *Pteropus*, Ralum, Bismarck Arch.; v. LINSTOW, Arch. Naturg. 1897, p. 283. *F. rubra*, Leidy, diagnosis; CONDORELLI-FRANCaviglia (5), p. 134. *F. foveolata*, Mol., and *leptoptera*, Rud., notes on anatomy; LEPRI, p. 64.
- Gnathostoma*, bibliography; HUBER.
- Graphonema*, n. g., for *G. pachyderma*, n. sp. (not described), and for *G. vulgaris*, n. sp., the latter sp. common on Australian coast among algæ and in sand; COBB, P. Linn. Soc. N. S. Wales, xxiii, p. 406.
- Halichoanolaimus australis*, n. sp. (young only), sand near low-tide mark, Port Jackson; COBB, P. Linn. Soc. N. S. Wales, xxiii, p. 404.
- Heterakis australis*, n. sp., from small intestine of *Macropygia nigrirostris*, Ralum, Bismarck Arch.; v. LINSTOW, Arch. Naturg. 1897, p. 285.
- Heth*, n. g., with *H. juli*, n. sp., intestine of *Julus*, Moss Vale, N. S. Wales; COBB, Agric. Gaz. N. S. W., ix, p. 299.
- "*Hoplocephalus*," n. g., with several rings of hooks round the anterior part of the body, for *N. cinctus*, n. sp., intestine of *Perameles obesula*; v. LINSTOW, Denk. Ges. Jena, viii, p. 469, [generic name shown to be pre-occupied, Zool. Anz., Litteratur, xxi, p. 226].
- Ichthyonema acipenseris*, n. sp., in abdominal cavity of *Acipenser sturio*; LUPO, Atti Acc. Torino, xxxiii, p. 825.
- Ironus entzii*, n. sp., L. Balaton; v. DADAY (2), p. 96.
- Labyrinthostoma*, n. g.; COBB, Agric. Gaz. N. S. W. ix, p. 421.
- Lepidonema*, n. g., with *L. bifurcata*, n. sp., in insect larva, Moss Vale, N. S. Wales; COBB, Agric. Gaz. N. S. W. ix, p. 315.
- Monhystera dubia*, Butshl., and *M. stagnalis*, Bast., notes and figures; v. DADAY (2), pp. 86 & 109.
- Mononchus macrostoma*, Bast., description and figure; v. DADAY (2), p. 96.
- Oncholaimus pellucidus*, n. sp., sand near low-tide mark, Port Jackson; COBB, P. Linn. Soc. N. S. W. xxiii, p. 394.
- Oxystoma pellucida*, n. sp., mud below low-tide mark, Port Jackson; COBB, l. c., p. 395.
- Oxyurus biuncinata*, n. sp., from intestine of *Ammocetes branchialis* (larva of *Petromyzon planeri*); v. LINSTOW, Arch. mikr. Anat. li, p. 759.
- Physaloptera sicuri*, n. sp., intestine and stomach of *Sciurus melanogaster*, Mentawai, table for comparison with *P. circularis*, v. Linst., and

- P. muris brasiliensis*, Molin, both from spp. of *Mus*, Madagascar and Brazil respectively; PARONA, Ann. Mus. Genova, xix, p. 118.
- P. alata*, Rud., notes on anatomy; LEPRI, p. 56.
- Plectus agilior*, n. sp., and *P. parietinus*, Bast., var. *australis*, n. var., on grass and blanched stems of celery, Sydney; COBB, P. Linn. Soc. N. S. Wales, xxiii, p. 397.
- Rhabditis cylindrica*, n. sp.; COBB, Agric. Gaz. N. S. W. ix, p. 448.
- Rhabdolaimus balatonicus*, n. sp., L. Balaton; v. DADAY (2), p. 102.
- Rhigonema*, n. g., with *R. brevicollis*, n. sp., intestine of *Julus*, Moss Vale, N. S. Wales; COBB, Agric. Gaz. N. S. W. ix, p. 311.
- Rictularia plagiostoma*, Wedl., intestine of *Sciurus*, Mentawai, new host and new locality; PARONA, p. 117.
- Sclerostomum equinum*, O. F. M., hybrid between zebra and Iceland pony as host; Arch. parasit. i, p. 629.
- Sphærolaimus hirticollis*, n. sp., sand near low-tide mark, Port Jackson; COBB, P. Linn. Soc. N. S. Wales, xxiii, p. 393.
- Spira similis*, n. sp., sand near low-tide mark, Port Jackson; COBB, *l. c.*, p. 390.
- Spiroptera furcata*, n. sp., in cœlom of a "toad-like frog," Ralum, Bismarck Archipel.; v. LINSTOW, Arch. Naturg. 1897, p. 284.
- S. mugientis*, n. sp., larva, in cysts outside wall of stomach and intestine of *Rana mugiens*; v. LINSTOW, Arch. mikr. Anat. li, p. 761.
- S. denticulata*, Mol., and *S. strigis*, R., note on anatomy; LEPRI, p. 61.
- Streptogaster*, n. g., with *S. papillatus*, n. sp.; COBB, Agric. Gaz. N. S. W., ix, p. 320.
- Symplocostoma lacustris*, n. sp., L. Balaton, the only fresh-water representative of the genus; v. DADAY (2), pp. 103, 113.
- Terschillingia exilis*, n. sp., sand near low-tide mark, Port Jackson; COBB, P. Linn. Soc. N. S. Wales, xxiii, p. 392.
- Trichosoma contortum*, Crepl., notes on anatomy; LEPRI, p. 55.
- Trilobus tenuicaudatus*, n. sp., L. Balaton, and *T. gracilis*, Bast., description and figure, and another sp.; v. DADAY (2), pp. 97 & 111.
- Tripyla dentata*, n. sp., L. Balaton, p. 89, and *T. gigantea*, n. sp., Small L. Balaton, p. 110, and 2 other spp.; v. DADAY (2).
- Tropidocerca inflata*, Dies., in flamingo; LÜHE, p. 623.
- Xyo*, n. g., with *X. histrix*, n. sp., intestine of beetle (*Pasalus*), Moss Vale, N. S. Wales; COBB, Agric. Gaz. N. S. W., ix, p. 315.
- Zoniolaimus*, n. g., with *Z. setifera*, n. sp., stomach of brush-wallaby, Moss Vale, N. S. Wales.; COBB, *l. c.*, pp. 312, 340 & 341.
- An immature *Nematode* (belonging to the group *Secernentes*), from *Dasypus hallucatus*, described and figured; v. LINSTOW, Denk. Ges. Jena, viii, p. 471.

(b) GORDIIDÆ & MERMIDÆ.

- Chordodes albibarbatus*, n. sp., Ogove R. and Goboan R., Africa, pp. 381 & 493, and *C. furnessi*, n. sp., from two different genera of leaf-mantids, Borneo, p. 379; MONTGOMERY, Zool. Jahrb. Syst. xi.
- C. cubanensis*, n. sp., Cuba, p. 52, *C. gordioides*, n. sp., S. Montana, p. 49, *C. morgani*, n. sp., Maryland and Iowa, p. 47, *C. occidentalis*, n. sp., San Francisco and Arizona, p. 50, and *C. puerilis*, n. sp., from a cockroach and free, in Chester Co., Pennsylvania, p. 48; MONTGOMERY, Bull. Mus. Harvard, xxxii.
- C. dugesi*, ♂ only, and *C. griffinni*, n. sp., Altoyec (Vera-Cruz); CAMERANO, Bull. Soc. zool. France, xxiii, p. 73.
- C. occidentalis*, n. sp., N. America; MONTGOMERY, Bull. Mus. Harvard and P. Calif. Ac. i, p. 336.
- Gordius agassizi*, n. sp., Sandwich Islands, p. 38, *G. capito-sulcatus*, n. sp.,

Cuba, p. 39, *G. densareolatus*, n. sp., Wyoming, p. 33, *G. leidy*, n. sp., loc. ?, p. 37, *G. platycephalus*, n. sp., Guatemala and S. Montana, p. 34, and *G. aquaticus difficilis*, n. subsp., Roan Mt., N. Carolina, p. 31, and description of 5 other American spp.; MONTGOMERY, Bull. Mus. Harvard, xxxii.

G. longareolatus, n. sp., and 3 other spp., N. America; MONTGOMERY, P. Calif. Ac. i, p. 334.

G. subspiralis, Dies., in Mexico; CAMERANO (1), p. 75.

Mermis africana, n. sp., S. W. Africa, *M. australis*, n. sp., N. Zealand, *M. brasiliensis*, n. sp., from a spider, S. Brazil, and *M. costaricensis*, n. sp., Costa Rica, larval forms only; *M. lacustris*, Duj., adult described for first time, referred to n. g. *Paramermis*; v. LINSTOW, Arch. mikr. Anat. liii, pp. 149-168.

Parachordodes, genus referred to *Paragordius*; MONTGOMERY, Bull. Mus. Harvard, xxxii.

Paragordius, Camer., with *P. (Gordius) varius*, Leidy, as type, characteristics of genus; reference of genus *Parachordodes* to it; MONTGOMERY, Bull. Mus. Harvard, xxxii, pp. 43 & 54.

Paramermis, n. g., for *P. (Mermis) lacustris*, Duj., and for *P. (M.) crassa*, v. Linst., ♂ with only 1 spicule; v. LINSTOW, Arch. mikr. Anat. liii, p. 149.

B.—ACANTHOCEPHALA.

Echinorhynchus horridus, n. sp., intestine of *Sauropatis sancta*, Ralum, Bismarck Arch.; v. LINSTOW, Arch. Naturg. 1897, p. 290.

E. (Gigantorhynchus) semoni, n. sp., from intestine of *Perameles obesula*; v. LINSTOW, Denk. Ges. Jena, viii, p. 471.

E. globosus, 3 types of hooks distinguished; MÜHLING, p. 110.

E. annulatus, Mol., and *E. agilis*, Rud., from Italian fish; CONDORELLI-FRANCAVIGLIA (5), p. 136.

E. globocaudatus, Led., and 2 other species in Roman birds of prey; LEPRI, p. 204.

E. gibbosus, Rud., = young form of *E. strumosus*, Rud., of intestine of *Halichærus grypus*; MÜHLING, Arch. Naturg. lxiv, p. 110.

Gigantorhynchus moniliformis, Bremser, life history; MAGALHÃES.

C.—CHÆTOGNATHA.

See AURIVILLIUS, NORDGAARD, SCOTT.

No new species.

V. HEMICHORDA (including *Phoronis*).

334. OKA, A. Sur une nouvelle espèce japonaise du genre *Phoronis*. Annot. zool. Japon. i, pp. 147 & 148.

335. ROULE, L. Sur la place des Phoronidiens dans la classification des animaux et sur leurs relations avec les Vertébrés. C.R. Ac. Sci. cxxvii, pp. 633-636.

336. WILLEY, A. Some points on the morphology of the *Enteropneusta*. P. Camb. Soc. x, p. 37.

BIOLOGY.

WILLEY gives a brief abstract of the theoretical part of his forthcoming monograph on the *Enteropneusta* of the South Pacific which will be recorded next year.

ROULE briefly describes the development of *Phoronis sabatieri* which passes through a curious pupa-like stage. He regards the genus as more nearly allied to the *Bryozoa* than to the *Vertebrata*.

DISTRIBUTION.

PEDASCHENKO (226) mentions 1 sp. of *Enteropneusta* in the White Sea referring it to the Genus *Saccoglossus*.

A new sp. of *Phoronis* is described from Japan by OKA (334). PRUVOT (235) refers to the Mediterranean species.

SYSTEMATIC.

Phoronis ijimai, n. sp., dredged opposite Moroiso, near Misaki; OKA, Annot. zool. Japon. i, p. 147.

VI. ROTIFERA.

TITLES.

337. AURIVILLIUS, C. W. S. Vergleichende thiergeographische Untersuchungen über die Planktonfauna des Skageraks in den Jahren 1893-1897. Svenska Ak. Handl. xxx, 426 pp., including numerous tables.
338. CALMAN, W. T. (1) The progress of research on the reproduction of the *Rotifera*. Nat. Sci. xiii, pp. 43-51.
339. —. (2) Rotifers in Lake Bassenthwaite. Nature, lviii, p. 271.
340. DADAY, E. v. Mikroskopische Süsswasserthiere aus Ceylon. Termes. Füzetek, xxi, 123 pp., 55 figg.
341. GARBINI, A. Un pugillo di Plankton del lago di Como. Atti Ist. Veneto (2), ix, pp. 668-679.
342. HÄCKER, V. Ueber vorbereitende Theilungsvorgänge bei Thieren und Pflanzen (Vortrag). Verh. Deutsch. zool. Ges. viii, pp. 94-119, 13 figg.
343. HEMPEL, A. A list of *Protozoa* and *Rotifera* found in the Illinois River and adjacent Lakes at Havana, Ill. Bull. Illinois Lab. v, pp. 342-388, 2 figg.
344. HICKSON, S. J. Rotifers in Lake Bassenthwaite. Nature, lviii, p. 200.
345. JENNINGS, H. S. *Trochosphaera solstitialis*. Science, 1898, p. 551.

346. LAUTERBORN, R. (1) Ueber die cyclische Fortpflanzung limnetischer Rotatorien. Biol. Centrbl. xviii, pp. 173–183.
347. —. (2) Vorläufige Mittheilung über den Variationskreis von *Anuræa cochlearis*, Gosse. Zool. Anz. xxi, pp. 597–604, 6 figg.
348. LEMMERMAN, E. Der grosse Waterneverstorfer Binnensee. Eine biologische Studie. Forschungsber. Plon, vi, pp. 166–205, pl. v. Rotifers pp. 181–186, 188.
349. LENSSEN, —. Contribution à l'étude du développement et de la maturation des œufs chez l'*Hydatina senta*. 1. Zool. Anz. xxi, pp. 617–622, 9 figg., and, in greater detail, Cellule, xiv, pp. 421–451, 2 pls.
350. LORD, J. E. Two new Rotifers. J. Quekett Club, vii, pp. 75–80, pl. vii.
351. MARCHOUX, E. Note sur un Rotifère (*Philodina parasitica*, n. sp.) vivant dans le tube digestif de larves aquatiques d'insectes. C.R. Soc. biol. v, pp. 749 & 750.
352. MRÁZEK, A. Zur Embryonalentwicklung der Gattung *Asplanchna*. SB. Böhmisch. Ges. 1897, No. lviii, 11 pp., 1 pl.
353. RICHARD, J. Sur la faune des eaux douces explorées en 1898 pendant la campagne du yacht "Princess-Alice." Mem. Soc. zool. France, xi, pp. 326–338.
354. ROTHERT, W. O parazitizmye rotatorii *Notommata vernecki* v vodorosli *Vaucheria*. Trudui Kazan. Univ. xxx, 1896, 18 pp., 1 pl. [On the parasitism of the Rotifer *N. v.* in der Alge *Vaucheria*.] In Russian.
See paper recorded Zool. Rec. 1896, Vermes, p. 45.
355. ROUSSELET, C. F. (1) Notiz. Zool. Anz. xxi, p. 595.
Identification of "*Monostyla appendiculata*, n. sp.," Skorikow, 1898, with *M. lamellata*, Daday, 1893.
356. —. (2) Species of *Pterodina*. J. Quekett Club, vii, pp. 24–30, pls. iii–v.
357. SHEPHARD, J. Some animals reared from dried mud. Victorian Natural. xv, pp. 48–50.
358. SKORIKOW, S. (1) Ein neues Räderthier. Zool. Anz. xxi, p. 556. Cf. ROUSSELET (355).
359. —. (2) Beiträge zur Kenntniss der Vertheilung der wirbellosen Thiere im Flusse Udy (Gouvern. Charkow). Arb. Naturf. Ges. Charcow. xxx, 1897, 13 pp., 1 pl. In Russian.
360. *STENROOS, K. E. Das Thierleben im Nurmijärvi-See. Eine faunistisch-biologische Studie. Acta Soc. Faun. Fenn. xvii, 259 pp., 3 pls and 1 map. Abstr. Zool. Centrbl. v, pp. 603–606.
361. TRGOVČEVIĆ, L. Prilog za faunu virniaka (Rotatoria). Glasnik Naravosl. druzt. x, pp. 89–139.
362. WEBER, E. F. Faune rotatorienne du bassin du Léman. 1^{re} partie. *Rhizota* and *Bdelloida*. 2^{me} partie. *Ploma* and *Scistopoda*. Rev. Suisse Zool. v, pp. 263–354, 355–785, pls. x–xv, xvi–xxv, and 2 figg. in text.
363. WESENBERG-LUND, C. Ueber dänische Rotiferen und über die Fortpflanzungsverhältnisse der Rotiferen (Vorl. Mitth.). Zool. Anz. xxi, pp. 200–211.

364. ZACHARIAS, O. (1) Untersuchungen über das Plankton der Teichgewässer. Forschber. Plon, vi, pp. 89–139, pl. iv.
365. —. (2) Das Heleoplankton. Zool. Anz. xxi, pp. 24–32.
36 spp. Rotifers enumerated.
366. —. (3) Das Potamoplankton, *t. c.*, pp. 41–48.
367. —. (4) Ueber einige interessante Funde im Plankton Sächsischer Fischteiche. Biol. Centrbl. xviii, pp. 714–718.
368. ZIMMER, C. Ueber thierisches Potamoplankton. Biol. Centrbl. xviii, pp. 522–524.

BIOLOGY.

TRGOVČEVIĆ gives an account of the anatomy, development and phylogeny of Rotifers with the biology and geographical distribution of the Croatian species belonging to 20 families.

CALMAN (1) gives a review of the present state of our knowledge of the reproduction of Rotifers. WESENBERG-LUND relates the conditions under which different kinds of eggs are produced in several Danish spp. of *Ploima*. LAUTERBORN (1) discusses the relation of the number of successive reproductive cycles to the species and their summer and winter varieties; and (2) draws attention to the regular rotation of varieties in species of *Anuræa*, determined from the measurement of 2000 individuals during the different months of the year.

LENSSEN describes and figures the maturation of the different kinds of eggs of *Hydatina senta*. MRÁZEK begins an account of the development of *Asplanchna* from the parthenogenetic eggs.

MARCHOUX describes a Rotifer parasitic in the alimentary canal of insect larvæ. ROTHERT discusses the parasitism of *Notommata* in *Vaucheria*.

DISTRIBUTION*.

Islands of Arctic Ocean: a few spp. identified; RICHARD.

British Isles: Rotifers of L. Bassenthwaite; CALMAN (2); HICKSON.

Skagerak: Plankton in different months of the year, for 5 years; AURIVILLIUS.

Denmark: 175 spp. *Ploima*; WESENBERG-LUND.

Schleswig-Holstein: 10 spp. from the Gt. Waterneverstorfer L.; LEM-MERMANN.

Germany: Plankton of Rivers, marshes and ponds; ZACHARIAS (1)—(4).—River Oder: bathymetrical distribution of spp.; SKORIKOW (2): Plankton; ZIMMER.

Finnland: 157 spp. from L. Nurmijärvi; STENROOS.

L. of Geneva and basin: two or three hundred species; WEBER.

L. Como: 5 spp.; GARBINI.

Canary Is.: 3 spp.; RICHARD. C.R. Ac. Sci. cxxvi, p. 440.

Ceylon: 42 spp.; DADAY.

Australia: 4 spp. from dried-up ponds in Victoria; SHEPHARD.

America: Illinois: River and Lakes, 108 spp.; HEMPEL. L. Erie: swamp in neighbourhood, as new locality for *Trochosphaera*; JENNINGS.

* [It was stated last year (*Zool. Rec. Vermes*, p. 48), that v. Daday had described some new spp. from L. Balaton. The paper (No. 281) has now been seen and none of the spp. there described are new.]

SYSTEMATIC.

Anurea cochlearis, varr. *hispida* and *irregularis*, n. varr. (summer), Upper Rhine ; LAUTERBORN (2) & (1).

Asplanchna brightwelli, var. *ceylonica*, n. var., Ceylon ; v. DADAY, Termes. Fuzetek, xxi.

A. herricki and *A. priodonta*, embryonic development ; MRÁZEK.

A. herricki, de G., in Querdammteich, Castle Zschorna, Saxony ; ZACHARIAS (4).

Brachionus falcatus, n. sp., Ponds near Oppeln in Silesia, p. 133, and figure of and notes on *B. budapestiensis*, v. DADAY. *B. lineatus*, Scorig., referred to this sp. as a variety, p. 134 ; ZACHARIAS, Forschber. Plön, vi.

Brachionus, several representatives of the genus shown to be pelagic ; LEMMERMANN, p. 183.

B. charesi, n. sp., Azores ; BARROIS, Mem. Soc. Lille, Ser. vi, Fasc. vi, Fayal, p. 124.

B. bakeri, varieties very probably = different stages in growth or in order of hatching, by comparison with *B. pali* and with a sp. of *Anurea* ; SHEPHARD.

Callidina brycei, n. sp., moss and detritus of dead wood, pond near Geneva ; WEBER, Rev. Suisse Zool. v, p. 347.

C. cataracta, n. sp., amongst confervoid algæ on dripping rocks, Rossendale ; LORD, J. Quekett Club, vii, p. 77.

Cathypna brachydactyla, *flexilis*, *magna*, n. spp., and *C. magna* var. *tenuior*, n. var., L. Nurmijärvi, Finland ; STENROOS, Acta Soc. Faun. Fenn. xvii.

C. macrodactyla, n. sp., Ceylon ; v. DADAY, Termes. Fuzetek, xxi.

Cælopus intermedius, n. sp., L. Nurmijärvi ; STENROOS, l. c.

Conochilus limneticus, n. sp., L. Nurmijärvi ; STENROOS, l. c.

Dinocharis similis, n. sp., L. Nurmijärvi ; STENROOS, l. c.

Distyla oxycauda, n. sp., L. Nurmijärvi ; STENROOS, l. c.

Eosphæra viridis, n. sp., L. Nurmijärvi ; STENROOS, l. c.

Furcularia macrodactyla and *F. trihamata*, n. spp., L. Nurmijärvi ; STENROOS, l. c.

Limnias nymphaeæ, n. sp., L. Nurmijärvi ; STENROOS, l. c.

Mastigocerca cuspidata, *grandis*, *rosea* and *unidens*, n. spp., L. Nurmijärvi ; STENROOS, l. c.

M. pusilla, n. sp. (not diagnosed), Upper Rhine ; LAUTERBORN (1).

Metopidia dactyliseta, *quadricarinata* and *sulcata*, n. spp., L. Nurmijärvi ; STENROOS, l. c.

Microcodides abbreviatus, n. sp., L. Nurmijärvi ; STENROOS, l. c.

Monommata appendiculata, n. sp., L. Nurmijärvi ; STENROOS, l. c.

Monostyla (*appendiculata*, n. sp.), L. Repnoe, Salt lake, Slawiansk (Charcow Govt.) ; SKORIKOW, Zool. Anz. xxi, p. 556 ; referred by ROUSSELET (1), t. c. p. 595, to *M. lamellata* ; Daday.

M. bicornis, n. sp., L. Nurmijärvi ; STENROOS, l. c.

Notommata monostylæformis, n. sp., L. Nurmijärvi ; STENROOS, l. c.

Notops fumicus, n. sp., L. Nurmijärvi ; STENROOS, l. c.

Philodina parasitica, n. sp., in rectum of *Chironomus plumosus* and of several spp. of *Culex*, in Senegal, round St Louis ; MARCHOUX, C.R. Soc. biol. v, p. 749.

Proales mirabilis, n. sp., L. Nurmijärvi ; STENROOS.

Pseudoecistes, n. g., for *P. rotifer*, n. sp., L. Nurmijärvi ; STENROOS.

P. clypeata, Ehrb., *P. cæca*, Parsons, *P. elliptica*, Ehrb., *P. reflexa*, Gosse, notes for identification of the spp., with figures of these and of

other spp. *P. valvata*, Hud.,?=young of *P. patina*, Ehrb.; ROUSSELET (2).

Pterodina emargulina, n. sp., L. Nurmijärvi; STENROOS, *l. c.*

Salpina macracantha, var. *ceylonica*, n. var., Ceylon; v. DADAY.

Stephanops bifurcus, n. sp.?, L. Nurmijärvi; STENROOS, *l. c.*

Taphrocampa nitida, n. sp., pond in Rossendale; LORD, J. Quekett Club, vii, p. 75.

Tetramastix, n. g., with *T. opoliensis*, n. sp., from the Oder and ponds near Oppeln; ZACHARIAS, Forschber. Plon, vi, p. 132.

VII. MESOZOA.

[Nothing to record.]

XVI. CŒLEENTERATA.

[For 1897 and 1898.]

By

R. T. GÜNTHER, M.A.,
Magdalen College, Oxford.

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I. TITLES.*

1. AGASSIZ, A. A visit to the Great Barrier Reef of Australia in the Steamer "Corydon." Bull. Mus. Harvard, xxviii, pp. 95-148, 42 pls.

2. —. The Island and Coral Reefs of the Fiji group. Amer. J. Sci. v, pp. 113-123 and Ann. Nat. Hist. i, pp. 231-242.

3. —. The Tertiary elevated Limestone Reefs of Fiji. Amer. J. Sci. vi, pp. 165-168.
Abstract, Zool. Centralbl. vi, p. 118.

4. — & MAYER, A. G. On *Dactylometra*. Bull. Mus. Harvard, xxxii, pp. 1-11, 13 pls.
Abstracts in J. R. Micr. Soc. 1898, p. 432 and Zool. Centralbl. v, pp. 706 & 707.

5. — & —. On some Medusæ from Australia. Bull. Mus. Harvard, xxxii, pp. 13-19, 3 pls.
Abstract in Zool. Centralbl. v, pp. 706 & 707.

* An asterisk prefixed to a quotation indicates that the Recorder has not seen the Journal or Work referred to.

6. ANDREWS, E. A. Some ectosarcal phenomena in the eggs of *Hydra*. Johns Hopkins Univ. Circ. xviii, pp. 1-3, 5 figg.
7. ANGELIS, J. DE. Descripcion de los Antozoos fossiles pliocenicos de Cataluña. 8vo, 26 pp., 1 pl. (Trad. esp. J. Almera.)
8. ——. Los primeros antozoos y briozoos miocenicos recogidos en Cataluña. 8vo, 31 pp., Barcelona, 1898. (Trad. de J. Almera.)
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10. ANGELIS, G. DE. I Corallari dei terreni terziari dell' Italia settentrionale. Collezione Michelotti. Museo Geologico della R. Università di Roma. Mem. R. Ac. Lincei, Ser. 5, i, pp. 164-280, pls. i-iii. [Bears date 1895, but ? published before 1899.]
11. [ANONYMOUS.] The confirmation of Darwin's theory of Coral Islands. Nat. Sci. xi, pp. 289 & 290.
12. ARNESEN, E. Beiträge zur Anatomie und Histologie von *Ulocyathus arcticus*, *Cariophyllia smithii*, *Dendrophyllia ramea* und *Cladocora cespitosa*. Arch. Naturv. Christian. xx, 1897, 30 pp., 2 pls.
13. ASHWORTH, J. H. The stomodæum, mesenterial filaments and endoderm of *Xenia*. P. Roy. Soc. lxiii, pp. 443-446, 3 figg. Abstracts in J. R. Micr. Soc. 1898, p. 633 and Zool. Centralbl. vi, p. 119.
14. AURIVILLIUS, C. W. S. Vergleichende thiergeographische Untersuchungen über die Plankton-Fauna des Skageraks in den Jahren 1893-1897. Svenska. Ak. Handl. xxx, 426 pp.
15. BABIĆA, K. Grada za poznavanje hrvatske faune hidroidpolipâ. Rad. Jugoslav. Ak. cxxxv, pp. 1-47.
16. BARROIS, T. Recherches sur la faune des eaux douces des Açores. Mem. Soc. Lille, vi, 1896, pp. 1-172.
17. BEEDE, J. W. Notes on *Campophyllum torquinum*, Owen, and a new variety of *Monopteria gibbosa*, Meek and Worthen. Kansas Quart. vii, pp. 187-190, 1 fig.
18. ——. New Corals from the Kansas Carboniferous. *T. c.* pp. 17 & 18. Abstract in N. Jahrb. Min. 1898, ii, p. 545.
19. BENEDEN, E. VAN. Die Anthozoen der Plankton-Expedition. Ergeb. der Plankton-Expedition, ii, K, e, 222 pp., 16 pls., 59 figg., 1898.
20. ——. Les Anthozoaires de la "Plankton-Expédition." Ergebnisse d. im atlant. Ocean ausgef. Plankton-Expedition, ii, 222 pp., 16 pls., 59 figg. [Same as 19.]
21. BERGER, E. W. Dr F. S. Conant's notes on the physiology of the Medusæ. Johns Hopkins Univ. Circ. viii, pp. 9-11.
22. BERNARD, F. Note sur des Méduses rapportées par M. Foà du lac Tanganyika et dénommées *Limnocyclus tanganyicæ* Böhm. Bull. Mus. Paris, 1898, p. 62.
23. BERNARD, H. M. Catalogue of the Madreporarian Corals in the British Museum (Natural History) Volume iii. The Genus *Montipora*, the Genus *Anacropora*. Large 4to, pp. vii+192, pls. xxxiv. London: printed by the order of the Trustees, 1897. Review, Nature, lvii, p. 363.
24. ——. On the affinities of the Madreporarian Genus *Alveopora* with the Palæozoic *Favositidæ*, together with a brief sketch of some of the

- evolutionary stages of the Madreporarian skeleton. J. Linn. Soc. Zool. xxvi, pp. 495–516, pl. xxx.
Abstracts in J. R. Micr. Soc. 1898, pp. 433, 434; Nature, lvii, pp. 262 & 263.
25. [BERNARD, H. M.] Notes, morphological and systematic on the Madreporarian subfamily *Montiporinæ* (*Montipora* and *Anacropora*) with an account of the phylogeny of the *Madreporidæ*. Ann. Nat. Hist. xx, pp. 117–135, pl. ii.
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26. BIRULA, A. Recherches sur la biologie et zoogéographie principalement des mers russes. I. Faune des méduses du golfe de Solovetzki. [Russian.] Annuaire Mus. St Petersburg. i, pp. 327–354.
27. —. Recherches sur la biologie et zoogéographie principalement des mers russes. II. Hydrozoaires, polychètes et crustacés, recueillis par le Dr A. Botkine en 1895 dans les golfes du Enisei et de l'Obi. [Russian.] *Op. cit.* 1897, pp. 78–94, pl. x.
28. —. V. Sur les rapports entre la structure morphologique de quelques Hydroides des côtes des Iles de Solovetzk et les conditions physiques des lieux qu'ils habitent. [Russian.] *Op. cit.* 1898, pp. 203–214, 4 figg.
29. BLANCHARD, R. & RICHARD, J. Sur la faune des lacs élevés des Hautes-Alpes. Mem. Soc. zool. France, x, pp. 43–61.
Abstract in IMHOF, Fauna der Seen, Biol. Centralbl. xviii, p. 172.
30. BOETTGER, O. Zur Kenntniss der Fauna der mittelmioicänen Schichten von Kostej im Banat. [*Deltocyathus italicus*, Michti.] Verh. siebenbürg. Ver. xlv, p. 57.
31. BONNEVIE, K. Zur Systematik der Hydroiden. Zeitschr. wiss. Zool. lxiii, pp. 465–495, 3 pls., 1 fig.
Abstract in J. R. Micr. Soc. 1898, p. 312.
32. BONNEY, T. G. The Boring at Funafuti. Nature, lix, p. 29.
33. BONTSCHEFF, ST. Das Tertiärbecken von Haskovo (Bulgarien). *Cælen-terata*, pp. 359–368. Jahrb. geol. Reichsanst. lxvi.
34. BRANDT, K. Die Fauna der Ostsee, insbesondere die der Kieler Bucht. Verh. deutsch. zool. Ges. vii, pp. 10–34.
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36. —. On *Tubularia crocea* in Plymouth Sound. J. Mar. Biol. Ass. v, pp. 54 & 55.
Abstract in J. R. Micr. Soc. 1897, p. 540.
37. —. The Hydroids of Valencia Harbour, Ireland. Irish Natural. vi, pp. 241–246.
38. —. Revised list of *Hydromedusæ* of the L. M. B. C. District. Tr. Liverpool Soc. xi, pp. 147–150.
39. —. On British *Medusæ*. P. Z. S. 1897, pp. 816–835, 2 pls., 12 figg.
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40. BRUNDIN, J. A. F. Alcyonarien aus der Sammlung des zoologischen Museums in Upsala. Bih. Svenska. Ak. xx, 22 pp., 2 pls.
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41. BUCHANAN, F. Note on the worm associated with *Lophohelia prolifera* (*Eunice gunneri*, Storm.). P. Dublin Soc. viii, pp. 432 & 433.
42. BURCHARDT, E. Alcyonaceen von Thursday Island (Torres-Strasse) und von Amboina. Semon, Zool. Forschungsreis. Austr. v, pp. 431–442, 2 pls., in Denkschr. Ges. Jena, viii.
43. CAMPENHAUSEN, B. VON. Hydroiden von Ternate. Abh. Senckenb. Ges. pp. 297–319, pl. xv. [Zool. Rec. 1896, No. 16.]
44. CANAVARI, M. La fauna degli strati con *Aspidoceras acanthicum* di Monte Serra presso Camerino. Pt. I (*Anthozoa*, etc.). Pal. italica, ii, pls. iv–ix, figg. 1–14.
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II. BIOLOGY.

ANATOMY, BIONOMICS, ETC.

Aquarium, keeping Medusæ alive in, BROWNE (35).

Bionomics of *Cordylophora*, HARGITT (126); corals, GARDINER (95); *Alicia mirabilis*, power of floating, DUERDEN (72); *Hydra*, FORREST (90).

Gas contained in the pneumatophor of *Physalia pelagica* Lk. consists of
 85—91 per cent. of Oxygen,
 9—15 " Nitrogen,
 No Argon.

SCHLOESING & RICHARD (204).

Development: of isolated blastomeres of *Beroë ovata*, FISCHER (89); of mesenteries of Actinians, CARLIGREN (45); *Arachnactis albida*, FOWLER (91); scyphopolyps, GOETTE (102); gonophors of *Physalia*, GOTO (103).

Budding in *Physophora*, CHUN (49); *Campanularia caliculata* Hincks, GIARD (100); *Madrepora*, KOCH (145).

Colours and pigments, NEWBIGIN (174).

"Entwickelungsmechanik," REEKER (197); *Tubularia*, DRIESCH (70); *Hydra*, WETZEL (239); *Beroë*, ZIEGLER (251).

Excretory pore of pneumatophor of *Physophora*, CHUN (48).

Histology of *Cœlenterata*, CHUN (47); *Hydra*, eggs, ANDREWS (6); *Madreporaria*, ARNESEN (12); *Xenia*, ASHWORTH (13).

Nematocysts, compilation of literature of morphology and development, LENDENFELD (156).

Nervous system and sense organs, correction of mistakes about date of publication, CLAUS (56).

Ocelli of *Hydromedusæ*, LINKO (158).

Parasitism: *Pemmatodiscus socialis* on *Rhizostoma pulmo*, MONTICELLI (169); parasite of *Bolina hydatina*, CHUN, MONTICELLI (169); crab-gall on *Millepora*, HICKSON (135); *Edwardsia leidy* in *Mnemiopsis leidy* Ag., VERRILL (231).

Physiology: *Cubomedusæ*, BERGER (21).

Regeneration: HARGITT (127); *Hydra*, PEEBLES (189, 190); *Gonionemus repens*, HARGITT (127).

Sarcostyles of *Plumularidæ*, NUTTING (178).

Symbiosis: *Lophohelia* and *Eunice gunneri*, BUCHANAN (41); *Discosoma haddoni* with commensal fish and crab, *Acerozoanthus* and its worm-tubes, photographs, SAVILLE-KENT (202); *Aurelia aurita* with *Acera bullata* (a mollusc) in its subgenital pits, Falmouth, VALLENTIN (228).

FAUNISTIC.

I. RECENT.

Adriatic, etc.

Adriatic; Rovinj, Senju; hydroids, BABIĆA (15).

Alaska; Hydrocorallines, DALL (64).

Alpine lakes; BLANCHARD & RICHARD (29); FUHRMANN (94).

Amboyna; *Actiniaria*, KWIETNIEWSKY (152); *Rhizostomata*, SCHULTZE (207).

America; *Actiniaria*, VERRILL (231), CUTLER (62); fresh-water jellyfish, *Microhydra ryderi*, POTTS (194).

Arctic; *Hydromedusæ*, GRÖNBORG (110); relations of fauna with Antarctic, CHUN (55), THOMPSON (222).

Atlantic, North; *Anthozoa*, BENEDEN (19); *Ctenophora*, CHUN (53); *Siphonophora*, CHUN (54).

Australia; SAVILLE-KENT (202); *Actiniaria*, HADDON & DUERDEN (119); medusæ, AGASSIZ & MAYER (5).

Azores; fresh-water fauna, BARROIS (16).

- Bahamas; *Actiniaria*, McMURRICH (166, 167).
 Baltic Sea; BRANDT (34).
 British Coasts:—Medusæ, BROWNE (39); hydroids, NUTTING (177); Irish Coasts, hydroids, DUERDEN (74); Filey, *Hydrozoa*, PETTY (193); Falmouth, *Tiaropsis multicirrata*, numerous in May, VALLENTIN (228); Liverpool District, hydromedusæ, BROWNE (38); Plymouth, *Tubularia crocea*, BROWNE (36); Port Erin, *Actiniaria*, HERDMAN (131); Valencia Island, hydroids, BROWNE (37).
 California; hydrocorallines, DALL (64).
 Djibouti; fauna of coral reefs, COUTIÈRE (61).
 Faeroe Channel; plankton, FOWLER (91).
 Falkland Island; *Anthomedusæ*, *Hippocrene macloviana*, recorded by PRATT (195).
 French Coasts:—Brittany, PRUVOT (196); Gulf of Lyons, PRUVOT (196); *Zoantharia Sclerodermata*, LACAZE-DUTHIERS (153); Normandy, KERVILLE (141).
 Fresh water; see under Azores, Tanganyika, Alpine Lakes, POTTS (194).
 Heligoland; *Hydromedusæ*, HARTLAUB (128).
 Jamaica; *Actiniaria*, DUERDEN (71, 75); *Zoantheæ*, DUERDEN (72, 73).
 Kerguelen region of Great Southern Ocean; MURRAY (173).
 Nahant, Lynn, Mass.; *Actiniaria*, CUTLER (62).
 New Zealand; *Actiniaria*, FARQUHAR (87); Dunedin Hydroids, HILGENDORF (136); Lyttelton Island, *Virgularia gracillima*, DENDY (66).
 Obi; *Hydrozoa*, BIRULA (27).
 Pacific, South; Corals, GARDINER (95–98).
 Plankton, Arctic and Antarctic compared, CHUN (55); Faeroe Channel, FOWLER (91); N. Atlantic, *Anthozoa*, BENEDEN (19); *Ctenophora*, CHUN (53); *Siphonophora*, CHUN (54); Red Sea, STEUER (217); Samoa, KRÄMER (148); Skagerak, AURIVILLIUS (14).
 Plattensee; hydroids, VÁNGEL (229).
 Red Sea; plankton, STEUER (217).
 Rockall Island; *Actiniaria*, HADDON (115); *Hydrozoa*, THORNELY (223).
 Rovigno; Hydropolyps, SCHNEIDER (206).
 Samoa; plankton, KRÄMER (148).
 Skagerak; plankton, AURIVILLIUS (14).
 Spitzbergen; *Actiniaria*, KWIETNIEWSKY (151); *Alcyonacea*, MAY (162).
 Solowetzki, Gulf of; Medusæ, Hydroids, BIRULA (26, 28).
 Tanganyika; *Limnocyda*, BERNARD (22).
 Ternate; *Actiniaria*, KWIETNIEWSKY (150); hydroids, CAMPENHAUSEN (43); *Rhizostomata*, SCHULTZE (208).
 Thursday Island; *Alcyonacea*, BURCHARDT (42).
 Torres Straits; *Actiniaria*, HADDON (117); *Alcyonacea*, BURCHARDT (42).
 Yenisei; *Hydrozoa*, BIRULA (27).

CORAL REEFS.

- Neu-Lauenburg (sections), DAHL (63); FRECH, general summary (93); GARDINER (95), HEDLEY (130), KRÄMER (148), MOORE (172), SLUITER (212), ULE (227), WHARTON (240), WIMAN, silurian reefs (249).
 Alexa Bank; WHARTON (240).
 Australia; Great Barrier Reef, AGASSIZ (1); Houtman's Abrolhos, pp. 132–152, SAVILLE-KENT (202).
 Djibouti; COUTIÈRE (61).
 Fiji; AGASSIZ (2); GARDINER (95); MOORE (172); tertiary limestone reef, AGASSIZ (3).
 Funafuti; results of reef-boring expedition, ANONYMOUS (10), BONNEY (32), DAVID (65), GARDINER (95), HEDLEY (129), SOLLAS (214–216), MOORE

(172), ULE (227). GARDINER (95) considers that the evidence justifies the following conclusions with regard to the reef at Funafuti :

1. The atoll has been elevated about 10 feet.
2. The land is now being washed away, the extent of the erosion being shown to some degree by the breadth of the rough zone.
3. The reef seems to have been mainly formed by the growth of nullipores, which are now building up masses outside the rim and adding them on to the reef, causing its extension seawards.
4. The lagoon does not seem to be filling up to any appreciable extent by the growth of shoals, etc., and solution is indicated by the characters of its slopes and floor.

HEDLEY (129) claims that

1. An elevation of Funafuti by at least 4 feet is proved by dead sub-fossil reef-corals in the position of life near high water-mark.
2. Darwin's theory of coral reefs as opposed to Murray's, is favoured by these facts :
 - a. Soundings show the atoll to be planted not on a bank but on a cone.
 - β. Soundings show it girdled by a precipitous submarine cliff, explicable only on the subsidence theory.
 - γ. Hedley's observations and the experience of residents agree that the lagoon is filling up.
3. A peripheral growth at present level is indicated on both sides of the islets.

Rotuma ; GARDINER (95).

Samoa ; an important paper by KRÄMER (148).

II. FOSSIL.

Bohemia ; Graptolites, PERNER (192).

Bulgaria, Haskovo ; Tertiary corals, BONTSCHIEFF (33).

Canada ; Stromatoporoids, WHITEAVES (241).

Cataluña ; ANGELIS (7-9).

Cincinnati Group ; JAMES (137).

Egypt ; *Madrepora*, GREGORY (106).

Indiana ; GREENE (105).

Lower Holderberg Group ; GIRTY (101).

Monte Serra, Camerino ; CANAVARI (44).

Scanian Rastrites Beds ; Graptolites, TÖRNQUIST (224).

Skiddaw Slates ; Graptolites, ELLES (80).

Victoria ; Graptolites, HALL (120, 121, 123) ; *Stylasteridæ*, HALL (122).

Neogenic : *Anthozoa*, SIMONELLI (211) ; Sardinia, OSSAT & NEVIANI (187).

Pliocene : *Anthozoa*, Cataluña, ANGELIS (7).

Miocene : *Anthozoa*, Cataluña, ANGELIS (8) ; Kostež, Banat, BOETTGER (30) ; Upper Burmah, NOETLING (176) ; Piedmont, OSASCO (184) ; Egypt, GREGORY (106).

Oligocene : Piedmont, OSASCO (185).

Eocene : *Actinozoa*, Lower Leigh Valley, Victoria, DENNANT & MULDER (68).

Calcareous : Switzerland, KOBY (142).

Tertiary corals of N. Italy : ANGELIS (10) ; Limestone reefs, Fiji, AGASSIZ (3) ; Haskovo, Bulgaria, BONTSCHIEFF (33) ; Victoria, HALL (122, 124) ; N. Greece, PENECKE (191) ; *Millepora*, HICKSON (134).

Older Tertiary : Australia, DENNANT (67).

Cretaceous : *Millestroma*, GREGORY (107) ; Switzerland, KOBY (143) ; Upper Silesia, LEONARD (157).

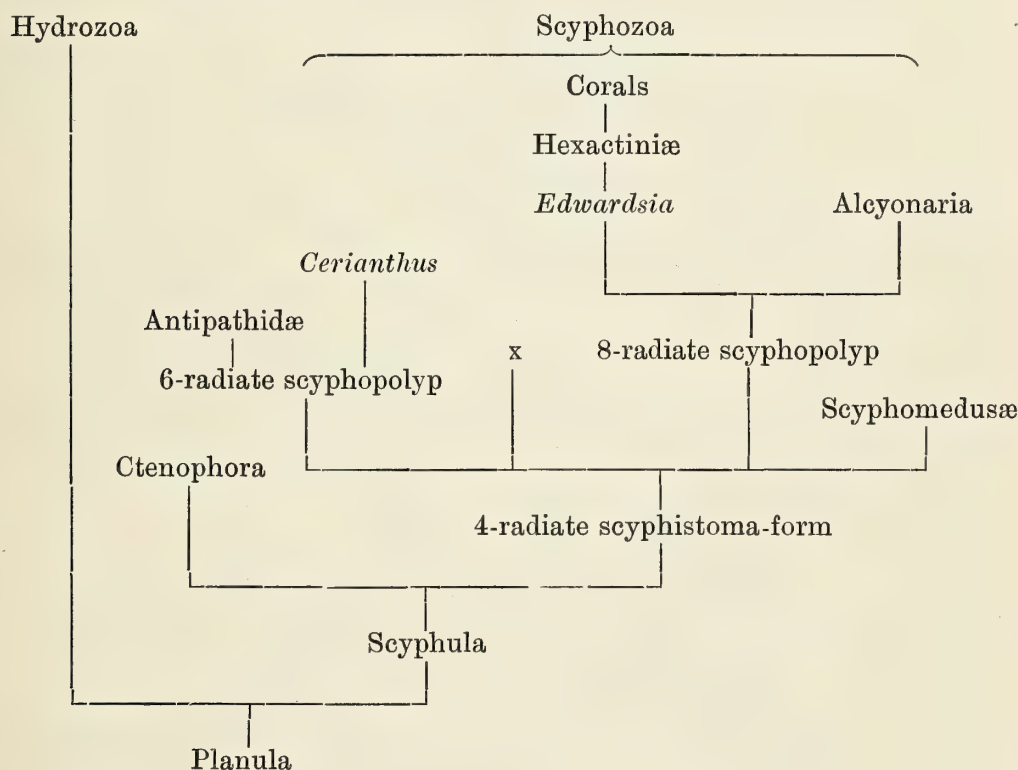
Upper Cretaceous : Mari Hills, NOETLING (175).
 Jurassic—Cretaceous : Stramberg, OGILVIE (179).
 Oolite : Purbeck and Portland, STRAHAN (218).
 Palæozoic : *Anthozoa*, Cataluña, ANGELIS (9); Corals, FRECH (92);
 Graptolites, Amazon, KATZER (139).
 Carboniferous : Kansas, BEEDE (18); New South Wales, KONINCK (147).
 "Steinkohlablagerungen" : Ural, Timan, STUCKENBERG (221).
 Devonian : New South Wales, KONINCK (147); Bosporus, Sea of Mar-
 mora, KAYSER (140).
 Silurian : *Columnaria*, *Endophyllum*, New South Wales, ETHERIDGE (82,
 85); New South Wales, KONINCK (147); Coral Reefs, WIMAN (249).
 Upper Silurian : GRÖNVALL (112); Victoria, DUN (78).

III. SYSTEMATIC.

General.

Literature for 1891, 1892, VANHÖFFEN (230); for 1896, 1897, MAYER &
 HEIDER (163, 164).

Classification suggested by GOETTE (102):—



HYDROZOA.

Classification; in his monograph on the groups of Hydroids found at
 Rovigno, SCHNEIDER (206) introduces a classification of the Hydrozoa
 with definitions of the groups found in the district, together with a
 discussion of the relationships of the genera to one another.

Fossil Medusæ; *Cryptodiscus* is probably a Crinoid, WELLER (237, 238);
 WALCOTT (232) has produced an elaborate and important monograph

upon Fossil Medusæ, with drawings and descriptions of the following genera and species :—

Middle Cambrian.

Brooksella alternata, Walcott; *confusa*, Walcott.

Laotira cambria, Walcott.

Lower Cambrian.

Dactyloidites asteroides, Fitch.

Medusina costata, Torell; *princeps*, Torell; *radiata*, Linnarsson.

Eophyton linneanum, Torell; *torelli*, Linnarsson.

Jurassic.

Semæostomites zitteli, Haeck.

Eulithota fasciculata, Haeck.

Acraspedites antiquus, Haeck.

Rhizostomites admirandus, Haeck.; *lithographicus*, Haeck.

Hexarhizites insignis, Haeck.

Leptobrachites trigonobrachiis, Haeck.; *gigantea*, Haeck.

Medusina deperdita, Beyrich; *quadrata*, Haeckel; *bicincta*, Haeck.; *staurophora*, Haeckel; *circularis*, Haeck.; *porpitina*, Haeck.

Permian.

Medusina atava, Pohlig.

Cretaceous.

Medusites cretaceus, Kner.; *latilobatus*, Ammon.; *helgolandicus*, Brandt.

Medusichnites, Matthew.

Discophyllum peltatum, Hall.

GYMNOBLASTEÆ—ANTHOMEDUSÆ.

Atractylis, sp.; HARTLAUB (128).

Bimeria vestita, Wright; HARTLAUB (128).

Bougainvillea benedenii [= *Eudendrium ramosum*, v. Ben.], pl. xxvi, figg. 34 & 35; BONNEVIE (31).

B. muscus, Allm., *B. flavida*, n. sp. (fig.), *B. xantha*, n. sp. (fig.); HARTLAUB (128).

Cordylophora lacustris, HARGITT (126); SELIGO (210).

Coryne hincksi, n. sp., Hammerfest, figg. 48 & 49; *C. longicornis*, n. sp., Husö, fig. 50; *C. ramosa*, Sars = *C. pusilla*, Gaertner; BONNEVIE (31).

C. vaginata, Hincks, 2 forms of species distinguished, Valencia; BROWNE (37).

C. pintneri, n. sp., Rovigno; SCHNEIDER (206).

Dendrocoryne inaba, member of a new family; GOTO (104).

Dicoryne conferta, Allm.; HARTLAUB (128).

Eudendrium stratum, n. sp., pl. xxvi, figg. 22–24; *E. planum*, n. sp., pl. xxvi, figg. 28–30; *E. annulatum*, Norman, pl. xxvi, figg. 31–33; *E. vaginatum*, Allm., pl. xxvi, figg. 24–26; BONNEVIE (31).

E. album, n. sp., Plymouth, pl. xiv, fig. 1; NUTTING (177).

Gymnogonos, n. gen. of *Tubularidæ*, *G. crassicornis*, n. sp., Trondhjemsfjord, pl. xxv, figg. 1–11; BONNEVIE (31).

Hemitheca, n. gen. of *Bougainvillidæ*, *H. intermedia*, n. sp., pl. xvi, figg. 2 & 2a, Dunedin; HILGENDORF (136).

Hydra viridis, *H. grisea*, Regeneration; PEEBLES (190).

H. fusca, movement by means of pseudopodia on tentacles; ZYKOFF (252).

H. fusca, *H. viridis*, occurrence recorded in Lakes of Gimont, Roche and Ascension; BLANCHARD & RICHARD (29).

H. rubra, Lewes, Lake Ritom, 1829 metres; FUHRMANN (94).

H. fusca, *grisea*, transplantation experiments; WETZEL (239).

Hydra, ectosarcial phenomena in eggs, ANDREWS (6); popular account, FORREST (90).

- Hydractinia echinata*; COLLCUTT (58). *H. allmanii*, n. sp., 827–1203 metres, N. Sea, pl. xxvi, figg. 36 & 37; *H. ornata*, n. sp., pl. xxvi, fig. 41; *H. minuta*, n. sp., fig. 38; *H. humilis*, n. sp., pl. xxvi, figg. 39 & 40; *H. sarsii* [= *Stylactis sarsii*], pl. xxvi, fig. 42, Allm.; BONNEVIE (31).
- Lampra*, n. gen. of *Tubulariæ*, *L. sarsii*, n. sp., 67° 56' N., 4° 11' E., 1423 metres, pl. xxvi, fig. 21; *L. purpurea*, n. sp., *L. atlantica*, n. sp.; BONNEVIE (31).
- Myriothela mitra*, n. sp., fig. 43; *M. minuta*, n. sp., fig. 44; *M. verrucosa*, n. sp., fig. 45; *M. gigantea*, n. sp., figg. 46 & 47; BONNEVIE (31).
- Perigonimus yoldiæ-arcticæ*, n. sp., Obi, BIRULA (27); *P. decorans*, n. sp., Rovigno, SCHNEIDER (206).
- P. vestitus*, Allm., *P. repens*, Wright, *P. serpens*, Allm.; HARTLAUB (128).
- Rhizogeton fusiformis*, Agassiz, Valencia; BROWNE (37).
- Syncoryne densa*, n. sp.; *S. ? sarsii*, Loven; *S. gravata*, Wright; HARTLAUB (128).
- Tubiclava fruticosa*, pl. xvi, figg. 1 & 1a, Dunedin; HILGENDORF (136).
- Tubularia*, "Entwickelungsmechanik"; DRIESCH (70).
- Tubularia variabilis*, n. sp., pl. xxv, fig. 12, North Sea; *T. asymmetrica*, n. sp., Trondhjemsfjord, pl. xxv, figg. 13–19; *T. obliqua*, n. sp., Hammerfest; *T. cornucopia*, n. sp., E. of Spitzbergen, pl. xxvi, fig. 20; BONNEVIE (31).
- T. attenoides*, pl. xvi, figg. 3 & 3a, Dunedin; HILGENDORF (136).
- T. crocea*, crossed Atlantic to Plymouth, attached to a ship; BROWNE (36).
- T. indivisa*, structure of polyps; *T. coronata*, development of eggs; GRÖNBORG (111).
- T. larynx*, Valencia; BROWNE (37).
- T. larynx*, figure of section; KÜKENTHAL (149).

Medusæ.

- Catablema campanula*, Haeck.; *C. eurystoma*, Haeck.; *C. vesicarium*, Agassiz, Arctic Ocean; GRÖNBORG (110).
- Chiarella centripetalis*, n. gen., n. sp., Gulf of California; MAAS (159).
- Codonium princeps*, Haeck., figg. 1 & 2, Arctic Ocean; GRÖNBORG (110).
- Cyæandra areolata*, Haeckel, pl. xlviii, figg. 1 & 2.
- Dipurena halterata*, Forbes, Valencia, pl. xlix, figg. 2, *a*, *b*; BROWNE (39).
- D. catenata*, Gulf of Cagliari; MONTICELLI (171).
- Hippocrene superciliaris*, Agassiz, figg. 5 & 6, Arctic Ocean; GRÖNBORG (110).
- Lar sabellarum*, Gosse, 9 figg. in text; BROWNE (39).
- Microhydra ryderi*, Fresh Water, N. America; POTTS (194).
- Sarsia brachygaster*, n. sp., figg. 3 & 4, Arctic Ocean; GRÖNBORG (110).
- Stomotoca divisa*, n. sp., G. of Panama; MAAS (159).

HARTLAUB (136) describes the following from Heligoland:—

- Sarsia*, sp. (fig.).
- Stauridium productum*, Hartlaub.
- Ectopleura dumortieri*, van Beneden.
- Steenstrupia galanthus*, Haeckel.
- Amphicodon fritillaria*, Haeckel.
- Lizzia claparédi*.
- Margelis principis*, Steenstr. (fig.).
- Bougainvillea superciliaris*, L. Agass. (fig.), *B. ramosa*, L. Agass., *B. bella*, n. sp. (fig.), *B. flavida*, n. sp. (fig.), *B. xantha*, n. sp. (fig.), *B. autumnalis*, n. sp. (fig.).
- Margelopsis haeckelii*, n. gen., n. sp. (fig.).
- Turritopsis polycirrha*, Keferstein (fig.).

CALYPTOBLASTEÆ—LEPTOMEDUSÆ.

- Aglaophenia filicula*, pl. xxi, figg. 2-2*b*; HILGENDORF (136).
A. helleri, Markt. Turn., pl. xvi, figg. 1-4, Eddystone; NUTTING (177).
Calycella gracilis, n. sp.; HARTLAUB (128).
C. parkeri, n. sp., pls. xvii & xviii, figg. 3*a-d*; HILGENDORF (136).
Calypothujaria clarkii, Markt., pl. xv, fig. 1; *C. opposita*, Camp., pl. xv, fig. 7; CAMPENHAUSEN (43).
Caminothujaria moluccana, Camp., pl. xv, fig. 8, Ternate; CAMPENHAUSEN (43).
Campalaria conferta, n. gen. & n. sp.; HARTLAUB (128).
Campanularia verticillata, L., HARTLAUB (128); *C. coruscans*, n. sp., Rovigno, SCHNEIDER (206); *C. caliculata*, Hincks, stolonisation & allogony, GIARD (100).
Campanulina hincksii, n. sp.; HARTLAUB (128).
Clytia johnstoni, Alder; id.
Cuspidella grandis, Hincks; HARTLAUB (128).
Diphasia, key to species of; *D. vegæ* (Thompson), Obi, fig.; BIRULA (27).
Halecium minimum, n. sp., Rovigno; SCHNEIDER (206).
Hypanthea asymmetrica, n. sp., pl. xx, figg. 4-4*b*,
H. bilabiata, pl. xx, figg. 5-5*a*; HILGENDORF (136).
Lovenella clausa, Lovén; HARTLAUB (128).
Obelaria, n. gen., *O. gelatinosa* (Pallas), fig.; HARTLAUB (128).
Obelia nigrocaulus, n. sp., pl. xvii, figg. 1 & 1*a*, Dunedin,
O. geniculata, pl. xvii, figg. 2 & 2*a*; HILGENDORF (136).
O. flabellata, Hincks; BIRULA (26).
Opercularella nana, n. sp.; HARTLAUB (128).
O. hispida, n. sp., Plymouth, pl. xiv, fig. 2; NUTTING (177).
Plumularia tenuis, n. sp., Rovigno; SCHNEIDER (206).
P. setacea, pl. xxi, figg. 1-1*d*; HILGENDORF (136).
P. allenii, n. sp., Plymouth, pl. xv, figg. 1-6; NUTTING (177).
Plumularid, sp., pl. xv, figg. 2-5; CAMPENHAUSEN (43).
Plumularidæ sarcostyles; NUTTING (178).
Sertularia bispinosa, *S. trispinosa*, *S. johnstoni*, *S. elongata*, *S. minima*,
S. polyzonias, pls. xix & xx; HILGENDORF (136).
Synthecium elegans, pl. xx, figg. 3 & 3*a*; HILGENDORF (136).
S. campylocarpum, Allm., pl. xv, fig. 6; CAMPENHAUSEN (43).
Thuiaria subarticulata, pl. xx, figg. 6 & 6*a*; HILGENDORF (136).
Trichydra pudica, Str. Wright; HARTLAUB (128).

Medusæ.

- Agastra mira*, n. gen., n. sp.; HARTLAUB (128).
Dipleurosoma hemisphæricum, Allm., Valencia, pl. xlviii, fig. 3; BROWNE (39).
Euchilota maculata, n. sp.; HARTLAUB (128).
Eucope, sp., Gulf of Panama; MAAS (159).
Eutonina socialis, n. gen., n. sp.; HARTLAUB (128).
Homæonema typicum, n. sp., G. of California; MAAS (159).
Laodice calcarata, Valencia, pl. xlix, fig. 4; BROWNE (39).
Melicertum proboscifer, n. sp., G. of Panama; MAAS (159).
Orchistoma, n. sp., G. of Panama; MAAS (159).
Polycanna forskalea (Forbes); BROWNE (39).
Staurophora laciniata, L. Agass.; HARTLAUB (128).

HYDROCORALLINÆ.

- Allopora moseleyi*, n. sp.; *A. papillosa*, n. sp.; *A. verrillii*, n. sp.; DALL (64).
Amphipora, ? sp., Devonian, between Pendik and Kantal; KAYSER (140).

Errina pourtalesii, n. sp.; DALL (64).

Millepora ampullæ, HICKSON (133); species of, HICKSON (132); tertiary, HICKSON (134); crab-gall, HICKSON (135).

Millestroma, n. gen. of *Milleporidæ*, *M. nicholsoni*, n. sp., Turonian, Abu Roasch, Egypt, pl. xiii, figg. 1a-e; GREGORY (107).

Polytremacis urgonensis, Koby, 1897, Morteau, Urganien; Koby (143).

P. abdita, n. sp., Tertiary, Italy; ANGELIS (10).

Sporadipora dichotoma, Mos., pl. xiii, figg. 2 & 3; GREGORY (106).

Stylasteridæ from Tertiary Strata of Victoria:—

Deontopora.

Sporadopora dichotoma.

Distichopora; HALL (122).

NARCOMEDUSÆ.

Aeginopsis laurentii, Brandt; BIRULA (26).

Solmaris, sp., Cocos Island; MAAS (159).

Solmundus glacialis, n. sp., Arctic Ocean; GRÖNBORG (110).

TRACHOMEDUSÆ.

Aglantha digitalis, F. O. Müller; BIRULA (26).

A. rosea, Forbes, Valencia, pl. xlix, figg. 1a-b; BROWNE (39).

Aglaura prismatica, n. sp., G. of Panama; MAAS (159).

Geryonia hexaphylla, Brandt, Galapagos; MAAS (159).

Liriope rosacea, Eschsch., W. coast of N. and Central America; MAAS (159).

Pectyllis arctica, Haeck., Arctic Ocean; GRÖNBORG (110).

Medusa incertæ sedis.

Limnecnida tanganyicæ, Böhm, Lake Tanganyika; BERNARD (22).

SIPHONOPHORA.

Classification, CHUN (50-52, 54); SCHNEIDER (205).

Geographical Distribution in warm and cold waters, CHUN (55).

The following classification has been proposed by CHUN (52, 54):—

Classis : *Siphonophoræ*, ESCHSCHOLTZ, 1829.

I. Ordo : *Calycophoræ*, LEUCKART, 1854.

I. Fam. *Monophyidæ*, CLAUS, 1874.

1. Sub-fam. *Sphæronectinæ*, HUXLEY, 1859.

2. Sub-fam. *Cymbonectinæ*, HAECKEL, 1888.

II. Fam. *Diphyidæ*, ESCHSCHOLTZ, 1829.

I. Tribus : *Oppositæ* (*Prayomorphæ*), CHUN.

1. Sub-fam. *Amphicaryoninæ*, CHUN, 1888.

2. Sub-fam. *Prayinæ*, KÖLLIKER, 1853.

3. Sub-fam. *Desmophyinae*, HAECKEL, 1888.

4. Sub-fam. *Stephanophyinae*, CHUN, 1891.

II. Tribus : *Superpositæ* (*Diphymorphæ*), CHUN.

5. Sub-fam. *Galeolarinæ*, CHUN, 1897.

6. Sub-fam. *Diphyopsinæ*, HAECKEL, 1888.

7. Sub-fam. *Abylinæ*, L. AGASSIZ, 1862.

III. Fam. *Polyphyidæ*, CHUN, 1882.

1. Sub-fam. *Hippopodiinæ*, KÖLLIKER, 1853.

II. Ordo : *Physophoræ*, ESCHSCHOLTZ, 1829.1. Legio : *Haplophysæ*, CHUN, 1888.I. Subordo : *Physonectæ*, HAECKEL, 1888.I. Fam. *Apolemidæ*, HUXLEY, 1859.II. Fam. *Forskalidæ*, HAECKEL, 1888.III. Fam. *Agalmidæ*, BRANDT, 1835.IV. Fam. *Nectalidæ*, HAECKEL, 1888.V. Fam. *Physophoridæ*, HUXLEY, 1859.VI. Fam. *Athoridæ*, HAECKEL, 1888.VII. Fam. *Anthophysidæ*, BRANDT, 1835.VIII. Fam. *Auronectidæ*, HAECKEL, 1888.II. Subordo : *Rhizophysaliæ*, CHUN, 1882.I. Fam. *Epibulidæ*, HAECKEL, 1888.II. Fam. *Rhizophysidæ*, BRANDT, 1835.III. Fam. *Physalidæ*, BRANDT, 1835.2. Legio : *Tracheophysæ*, CHUN, 1888.III. Subordo : *Chondrophoræ*, CHAMISSE, 1821.I. Fam. *Porpitidæ*, BRANDT, 1835.II. Fam. *Velellidæ*, ESCHSCHOLTZ, 1829.*Disconanthæ.**Porpita umbella*, O. F. Müller, CHUN (54).*Velella spirans*, Forskål (fig.), CHUN (54).*Calyconectæ.**Abyla quincunx*, Chun (fig.), *A. pentagona*, Q. & G., *A. trigona*, Q. & G.,
A. perforata, Ggbr., CHUN (54).*Desmophyes annectens*, Haeck. (fig.), CHUN (54).*Diphyes arctica* (fig.), *D. bipartita*, CHUN (54); *D. quadricalcis*, histology
of nervous system, SCHAEPPi (203).*Diphyopsis campanulifera*, Q. et G. (fig.), CHUN (54).*Eudoxia eschscholtzii*, Busch. (fig.), CHUN (54).*Hippopodius*, nervous system, SCHAEPPi (203); *H. luteus*, Q. & G. (fig.),
CHUN (54).*Muggiæa kochii*, Ch. (fig.), CHUN (54).*Praya cymbiformis*, D. Chiaje (fig.), CHUN (54); *P. maxima*, nervous system,
SCHAEPPi (203).*Sphæronectes gracilis*, Ch., CHUN (54).*Stephanophyes superba*, Ch., CHUN (54).*Vogtia pentacantha*, Köll. (fig.), CHUN (54).*Physonectæ.**Anthophysa formosa*, Fewkes (fig.), CHUN (54).*Anthorybia melo*, Q. et G. (fig.), pneumatophor, CHUN (54).*Crystallomia polygonata*, Dana (fig.), CHUN (54).*Cupulita (Halistemma) picta*, Metschn. (fig.), CHUN (54).*Forskalia leukarti*, *F. contorta*, *F. edwardsii*, figures of histological detail,
SCHAEPPi (203).*Halistemma rubrum*, do.*Nectalia loligo*, Haeck. (fig.), CHUN (54).*Physophora hydrostatica*, Forsk., pneumatophor, excretory pore, law of
budding, CHUN (48, 49); nervous system, SCHAEPPi (203).

Rhizophysalæ, Chun.

Structure and relationships, CHUN (54).

Physalia utriculus, La Mart. ; *P. arethusa*, Browne ; *P. maxima*, gonophor development, GOTO (103).

Rhizophysa eysenhardtii, Ggbr. ; *R. murrayana*, Haeck. ; *R. filiformis*, CHUN (54).

RHABDOPHORA.

Recent literature reviewed by RUEDEMANN (199), TORNQUIST (225).

Lower Silurian, New South Wales, DUN (79) ; Skiddaw Slates, ELLES (80) ;

Southern Alps, GEYER (99) ; Victoria, HALL (120, 121).

Fauna ; Coimaidai, Victoria, HALL (123).

Life History ; WALTER (233), GÜRICH (114), LAPWORTH (154).

Taxonomy ; Graptolites divided into two series derived from a *Bryograptus* form and a *Clonograptus* form respectively ; ELLES (81).

Graptolite ? species from Amazons, pl. ii ; KATZER (139).

Cephalograptus, monograph on subgenus ; *C. petalum*, n. sp. ; ELLES (81).

Climacograptus scalaris (Linné ?), Hisinger, *C. medius*, n. sp., *C. rectangularis*, McCoy, *C. undulatus*, Kurck ; TORNQUIST (224).

C. bicornis, J. Hall, Ordovician, Victoria ; HALL (120). *C.*, sp. ; WIMAN (250).

Dicellograptus elegans, Carr., Ordovician, Wombat Creek ; ? *D. sextans*, J. Hall, Tungamah, Ordovician ; *D. anceps*, Nich., Ordovician, Walwal Creek, Victoria ; HALL (120).

? *Dicranograptus ramosus*, J. Hall, Tungamah, Ordovician, Victoria ; HALL (120).

Dictyonema grande, T. S. Hall, re-named *D. macgillivrayi* ; HALL (121).

D. cavernosum, n. sp. ; WIMAN (248) ; sections figured ; WIMAN (250).

D. tuberosum, Wiman, sections figured ; WIMAN (250).

Dimorphograptus, cf. *swanstoni*, Lapworth ; RUEDEMANN (200).

Diplograptus, development ; RUEDEMANN (200).

Diplograptus palmeus, Barrande, *D. folium*, Hisinger, *D. acuminatus*, Nicholson, *D. cometa*, Geinitz, *D. tamariscus*, Nicholson, *D. cyperoides*, n. sp., *D. longissimus*, Kurck. All from the Scanian Rastrites Beds ; TORNQUIST (224).

D. pristis, Hisinger, Tungamah, Ordovician ; *D. truncatus*, Lapw., Ordovician, Walwal Creek, Victoria ; HALL (120).

Heteroprionidæ of Scanian Rastrites Beds, TORNQUIST (224).

Monograptus priodon, GÜRICH (113).

Petalograptus, sub. gen. *P. minor*, n. sp. ; ELLES (81).

STROMATOPOROIDEA.

Structure and classification ; LEBEDEF (155).

Canadian Stromatoporoids, result of microscopic investigation of 28 species ; WHITEAVES (241).

Hermatostroma episcopale, Nich., pl. xiii, fig. 5 ; GREGORY (106).

Stromatocerium, SEELEY (209).

Stromatopora, sp. (fig.), Russia ; STUCKENBERG (220).

S. concentrica, Goldf. non Nicholson ; FRECH (92).

SCYPHOZOA.

STAUROMEDUSÆ.

- Haliclystus octoradiatus*, Clark ; BIRULA (26).
Lucernaria quadricornis, F. O. Müller ; BIRULA (26).
L. pagatensis, n. sp., Japan ; OKA (183, 184).

CUBOMEDUSÆ.

See CONANT (59, 60).

Anatomy, development, habitat, physiology, action of light, temperature, etc. ; BERGER (21).

- Charybdea xaymacana*, fig. 8 ; CONANT (60).
C. arborifera, n. sp., Honolulu ; MAAS (159).
Tripedalia cystophora, fig. 9 ; CONANT (60).
Tripedaliidæ, new family ; CONANT (60).

PEROMEDUSÆ.

- Periphylla dodecabostrycha*, Brandt ; *P. mirabilis*, Hckl., excellent description of anatomy ; MAAS (159).
P. regina, Hckl. ; MAAS (159).

DISCOMEDUSÆ.

Photographs of Discomedusæ ; SAVILLE-KENT (202).

- Atolla alexandri*, n. sp. ; MAAS (159).
A. gigantea, n. sp. ; MAAS (159).
Aurelia aurita, Lam., *A. flavidula*, Peron et L. ; BIRULA (26).
Cyanea arctica, Peron et L. ; BIRULA (26).
Dactylometra quinquecirra, pls. i-xi, *D. lactea*, pls. xii & xiii ; AGASSIZ & MAYER (4).
Desmonema rosea, n. sp., Largo Bay, Adelaide, pl. i, fig. 1 ; AGASSIZ & MAYER (5).
Nauphanta albatrossi, n. sp., *N. duplicata*, ? n. sp. ; MAAS (159).

RHIZOSTOMEÆ.

- Crambessa mosaica*, Haeckel, pls. ii & iii ; AGASSIZ & MAYER (5).
Drymonema, ? sp. ; MAAS (159).

SCHULTZE (207) describes the following from Amboyna :—

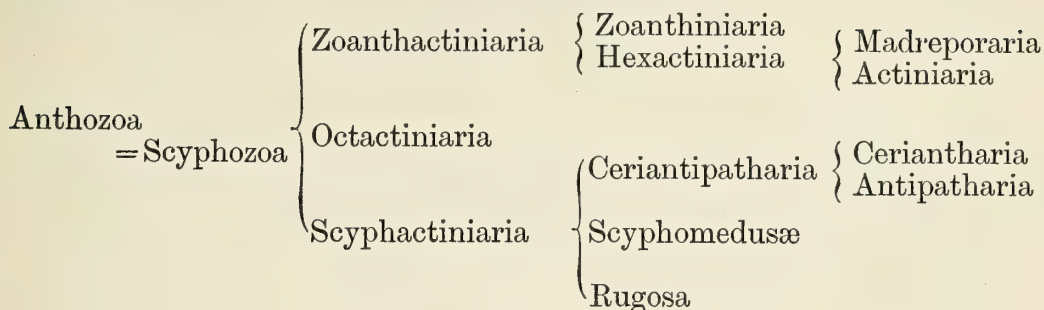
- Cassiopeja acycloblia*, n. sp., pl. xxxiii, figg. 2, 4, 6, pl. xxxiv, fig. 15.
Crambessa palmipes, Haeck., 2 figg.
Halipetasun, n. gen.
H. scaber, n. sp., pl. xxxiii, fig. 7.
Himantostoma loriferum (Hempr. et Ehrbg.), Haeckel, pl. xxxiv, fig. 9.
Mastigias physophora, Kishinouye.
Netrostoma typhlodendrium, n. sp., pl. xxxiv, figg. 10, 12, 12a.
Thysanostoma thysanura, H., figg. 3 & 8.
Toxoclytus turgescens, n. sp., pl. xxxiv, figg. 13 & 14.

and from Ternate (208) :—

- Cassiopea*, sp., pl. xv, figg. 3 & 7.
Crambessa stiphroptera, n. sp., pl. xv, figg. 4-5a.
Himantostoma loriferum (Hempr. et Ehrbg.), Haeckel, var. *pacifica* (nov.).
Mastigias, sp., pl. xv, fig. 2 ; SCHULTZE (208).

ANTHOZOA.

VAN BENEDEN (19) proposes a new classification :—



ZOANTHARIA.

ACTINIARIA.

Development of mesenteries; CARLGREN (45).

Preservation; CHOLODKOVSKY (46).

Development: GOETTE (102).

Relationships: GOETTE (102).

Actiniaria of Jamaica, DUERDEN (71–73, 75); New Zealand, FARQUHAR (87), 7 n. spp. (not recorded); Port Erin, 21 spp., HERDMAN (131); Ternate, KWIETNIEWSKI (150), Amboyna and Thursday Island (152); E. Spitzbergen, KWIETNIEWSKI (151).

VAN BENEDEN (19) has worked out the larval Actinarians collected by the Plankton expedition, and has published a valuable monograph upon them. The position of the *Cerianthæ* is considered, and the following larval forms are described and figured :—

Larvæ of *Arachnactis albida*, M. Sars.

- „ *A. lloydii*.
- „ *Cerianthus membranaceus*.
- „ *Ovactis brasiliensis*, n. sp.
- „ *O. æquatorialis*, n. sp.
- „ *O. bermudensis*, n. sp.
- „ *O. wilsoni*, n. sp.
- „ *Dactylactis armata*, n. sp.
- „ *D. digitata*, n. sp.
- „ *D. inermis*, n. sp.
- „ *D. elegans*, n. sp.
- „ *Solasteractis macropoda*, n. sp.
- „ *Apiactis denticulata*, n. sp.
- „ *Peponactis æquatorialis*, n. sp.
- „ *Cerianthula mediterranea*.
- „ *Hensenanthula*, n. sp.
- „ *H. dactylifera*, n. sp.
- „ *H. spinifer*, n. sp.
- „ *H. melo*, n. sp.
- „ *Calpanthula guineensis*, n. sp.
- „ Zoanthiniaria :—
- „ *Zoanthella henseni*, n. sp.
- „ *Z. semperi*, n. sp.
- „ *Zoanthina nationalis*.
- „ *Z. americana*.

Edwardsiæ.

E. elegans, n. sp. Wellington, *E. neozelanica*, n. sp. Lyall Bay; FARQUHAR (87).

Edwardsia clapedii, Panceri, anatomy of larva; MONTICELLI (170).

E. leidyi, n. sp., parasitic in *Mnemiopsis leidyi*, Ag. (a Ctenophor); VERRILL (231).

Ceriantheæ.

Cerianthus nobilis, H. & S.

Cerianthus, development; GOETTE (102).

Cerianthus ambonensis, n. sp.; *C. elongatus*, n. sp.; *C. sulcatus*, n. sp.; KWIETNIEWSKI (152).

Zoantheæ.

Acrozoanthus australiæ, with worm tubes figured by SAVILLE-KENT (202).

Epizoanthus hians, n. sp.; McMURRICH (166).

E. egeriæ, n. sp., S. China Sea, pl. vii, fig. 5, pl. viii, fig. 8; *Gemmaria canariensis*, n. sp., Canary Islands, pl. vii, fig. 2, pl. viii, figg. 4-6; HADDON & DUERDEN (119).

Isaurus duchassaingi, Andr. identical with *Antinedia tuberculata*, Duch. Mich. Structure; McMURRICH (167).

Palythoa nigricans, n. sp.; McMURRICH (166).

P. gregorii, *P. liscia*, nn. spp., E. Africa, pl. vii, figg. 3 & 4, pl. viii, fig. 7; HADDON & DUERDEN (119).

Parazoanthus dichroicus, H. & S., pl. xvii, figg. 12 & 13, Ternate; KWIETNIEWSKI (150).

Zoanthus shackletoni, n. sp., Adam's Bridge, pl. vii, fig. 1, pl. viii, figg. 1-3; HADDON & DUERDEN (119).

Z. sociatus, Ellis (fig.); McMURRICH (166).

DUERDEN (73) describes the following from Jamaica :—

Zoanthus solanderi (Lesueur), pl. xviiA, fig. 1; pl. xviiiA, fig. 1.

Z. flos-marinus (Duchassaing & Michelotti), pl. xviiA, fig. 2; pl. xviiiA, fig. 2.

Z. pulchellus (Duchassaing & Michelotti), pl. xviiA, fig. 3; pl. xviiiA, figg. 3 & 4.

Isaurus duchassaingi (Andres), pl. xviiA, fig. 4; pl. xviiiA, figg. 5 & 6.

Gemmaria variabilis, n. sp., pl. xviiA, fig. 5; pl. xviiiA, figg. 7-9.

G. fusca, n. sp., fig. 6; pl. xviiiA, fig. 10.

Palythoa mammosa (Ellis & Solander), pl. xviiA, figg. 7 & 8; pl. xix, figg. 1-4.

P. caribæa (Duchassaing & Michelotti), pl. xviiA, fig. 9; pl. xix, figg. 5-7.

Epizoanthus minutus, n. sp., pl. xviiA, fig. 10; pl. xx, figg. 1-4.

Parazoanthus swiftii (Duchassaing & Michelotti), pl. xviiA, fig. 11; pl. xx, figg. 5 & 6.

HADDON (117) describes the following from Torres Straits :—

Zoanthus coppingeri, H. & S., *jukesii*, H. & S., *macgillivrayi*, H. & S., *australiæ* (S.-Kent);

Isaurus asymmetricus, H. & S.;

Gemmaria macmurrichi, H. & S., *mutuki*, H. & S.;

Palythoa howesii, H. & S., *kochii*, H. & S., *cæsia*, Dana (?);

Sphenopus arenaceus, Hertw.;

Parazoanthus dichroicus, H. & S., *douglasi*, H. & S.

Hexactinice.

KWIETNIEWSKI (152) records the following from Amboyna and Thursday Island :—

Actinioides ambonensis, n. sp., pl. xxv, figg. 6–9; *A. haddoni*, n. sp., pl. xxv, figg. 1–3; *Condylactis parvicornis*, n. sp., pl. xxv, figg. 4 & 5; *Bolocera mcmurrici*, n. sp., pl. xxv, figg. 10 & 11.
Sagartiomorpha, n. gen.; *S. carlgreni*, n. sp., pl. xxv, fig. 12.
Phellia ambonensis, n. sp. (fig.); *Acremodactyla ambonensis*, n. sp. (fig.).
Actinostephanus, n. gen.; *A. haeckeli*, n. sp. (fig.).
Phyllo-discus, n. gen.; *P. semoni*, n. sp. (fig.).
Discosoma ambonensis, n. sp. (fig.); *D. tuberculata*, n. sp. (fig.); *Radianthus lobatus*, n. sp. (fig.).
Stichodactis, n. gen.; *S. papillosa*, n. sp. (fig.).
Helianthopsis, n. gen.; *H. ritteri*, n. sp. (fig.).
Phymanthus muscosus, Haddon & Shackl.; *P. levis*, n. sp.
Isohexactinia Tribus, Kwietniewski.
Gyrostomidae, n. fam.; *Gyrostoma*, n. gen.; *G. hertwigi*, n. sp. (fig.);
 KWIETNIEWSKI (152).

Actinia equina (Linn.), var. *mesembryanthemum*, pl. xxiv a, fig. 4, MAGUIRE (160); mesenteries and œsophageal grooves, CLUBB (57).
A. bermudensis, n. sp., var. *ferruginea*, n. var.; VERRILL (231).
A. tenebrosa, n. sp. Wellington; FARQUHAR (87).
Actinioides spenceri, n. sp., Port Philip; HADDON & DUERDEN (119).
Actinodendron alcyonidium, figured; SAVILLE-KENT (202).
Actinostola walteri, n. sp.,
A. spetsbergensis, Carlgren; KWIETNIEWSKI (151).
Adamsia tricolor (Lesueur), McMurrich; McMURRICH (166).
Alicia mirabilis, power of floating; DUERDEN (72, 77).
Aliciidae; DUERDEN (77).
Allantactis parasitica, Dunc., pl. xiv, figg. 1–3; KWIETNIEWSKI (151).
Arachnactis albida, M. Sars; *A. Bournei*, n. sp.; FOWLER (91).
Asteractis expansa, Duerden; McMURRICH (166).
Bolocera pollens, n. sp.; McMURRICH (166).
Branchiocerianthus, n. gen. of *Cerianthidae*, *B. urceolus*, Gulf of Panama, 286 fathoms; MARK (161).
Bunodeopsis antilliensis, n. sp., Jamaica, pl. i, figg. 1–4; *B. strumosa*, Andres, pl. i, fig. 5; DUERDEN (77).
Bunodes gemmacea, development; GOETTE (102).
Cereactis aurantiaca, development; GOETTE (102).
Chondractinia digitata, O. F. Müller; *C. nodosa*, Fabr.; KWIETNIEWSKI (151).
Condylactis, sp., fig.; SAVILLE-KENT (202).
C. cruenta, figg. 4 & 5, development of mesenteries; CARLGREN (45).
Corallimorphus, characters of genus; DUERDEN (76).
Corynactis,
C. haddoni, n. sp., 7 varieties, Lyall Bay, " *C. mollis*, n. sp., *C. gracilis*, n. sp. nr. Wellington; FARQUHAR (87).
C. australis, n. sp., Port Philip; HADDON & DUERDEN (119).
Cystiactis tuberculosa, Q. & G., N. S. Wales; do.
Dactylactis viridis, n. sp., Gulf Stream; VERRILL (231).
Diplactis bermudensis, McMURRICH (167).
Discosoma haddoni, figured with commensal fish and crab; SAVILLE-KENT (202).
Endocælectis, 3 figg., development of mesenteries; CARLGREN (45).
Halcampactis, n. gen.; FARQUHAR (87).
H. mirabilis, n. sp. near Wellington, pl. xxxvi, figg. 4–6; FARQUHAR (87).
Halcurias pilatus, McMurrich, '93; McMURRICH (166).
Heliactis bellis, development; GOETTE (102).
Heteractidae, n. fam.; McMURRICH (167).
Heteractis lucida, structure shows it to be a Sagartid; McMURRICH (167).

- Heteranthus*, McMurr. & *Homactis*, Verr. must be included in *Ricordea*, Duch.; McMURRICH (167).
Hexactiniæ, irregularities in development of mesenteries; McMURRICH (165).
Hoplophoria, Wils., and *Lebrunea*, Duch. Mich., are both included with *Dendromelidæ*; McMURRICH (167).
Leiothealia spetsbergensis, n. sp., pl. xiv, figg. 7-9; KWIETNIEWSKI (151).
Metridium, monogenesis; TORREY (226).
M. marginatum, anatomy; PARKER (188).
Mitactis, n. gen. of *Sagartidæ*,
M. australis, n. sp., *M. similis*, n. sp.; HADDON & DUERDEN (119).
Ophiodiscus, Hertw.; McMURRICH (167).
Paranthus chromatoderus, figg. 4 & 5; MAGUIRE (160).
Phellia sollasi, n. sp., HADDON (118); *P. ternatana*, Kwiet., pl. xvi, Ternate; KWIETNIEWSKI (150).
Physobranchia, sp., fig. in SAVILLE-KENT (202).
Radianthus kuekenthali, Kwiet., pl. xvi, figg. 3-7, Ternate; KWIETNIEWSKI (150).
Rhodactis, characters of genus; DUERDEN (76).
Ricoidea, characters of genus; DUERDEN (76).
Sagartia luciae, n. sp., *S. leucolena*, Ver.; VERRILL (231).
S. carlgreni, n. sp., Port Philip; HADDON & DUERDEN (119).
S. spongicola, Verrill; McMURRICH (166).
Stichodactylinæ, relations to Madreporaria; DUERDEN (76).
Thalassianthus senckenbergianus, Kwiet., pl. xvii, figg. 8-11, Ternate; KWIETNIEWSKI (150).

Hexactiniæ Actiniinæ from Torres Straits, HADDON (117):—

- Actinia citrina*, H. & S., xxii, figg. 1 & 2; xxvi, figg. 1-5.
Anemonia ramsayi, H. & S., xxii, figg. 3 & 4; xxvi, figg. 6 & 7.
A. kwoiam, H. & S., xxii, fig. 5; xxvi, figg. 8-11.
Actinioides dixoniana, H. & S., xxii, fig. 6; xxvii, figg. 1 & 2; *A. papuensis*, n. sp., xxii, fig. 7; xxvii, figg. 3-7; *A. sesere*, H. & S., xxii, figg. 8 & 9; xxviii, figg. 1 & 2.
Macrodactyla, n. g.,
M. aspera, H. & S., xxii, figg. 10 & 11; xxviii, figg. 3 & 5.
Alicia rhadina, H. & S., pl. xxiii, figg. 1-8.
Bunodeopsis australis, n. sp., pl. xxiii, figg. 9 & 10.
Hoplophoria cincta, H. & S., pl. xxiii, figg. 11-15.
Aulactinia gelam, H. & S., xxii, fig. 12; xxviii, figg. 6 & 7.
Ixalactis, n. g.,
I. simplex, H. & S., xxv, figg. 15-19; xxviii, figg. 8 & 9.
Sagartia milmani, H. & S., pl. xxiii, fig. 16; xxix, figg. 1-5.
S. plebeia, n. sp., pl. xxiii, fig. 17; xxix, fig. 12.
Phellia vermiformis, n. sp., pl. xxiii, fig. 18; xxviii, figg. 10 & 11.
P. sipunculoides, H. & S., pl. xxiii, figg. 19 & 20.
P. devisi, H. & S., pl. xxiii, figg. 21-24.
Calliactis miriam, H. & S., pl. xxiii, fig. 25.
Paraphellia huntii, H. & S., pl. xxiii, fig. 26; xxix, figg. 6-9.
P. lineata, H. & S., pl. xxiii, figg. 27 & 28; xxix, figg. 10 & 11.
Stichophora torpedo (Bell), pl. xxiii, figg. 29-33; xxx, figg. 5-11.

Hexactiniæ Stichodactylinæ from Torres Straits, HADDON (117):—

- Corynactis hoplites*, H. & S., pl. xxx, figg. 1-4.
Radianthus macrodactylus, H. & S., pl. xxxi, figg. 1-3.
R. malu, H. & S., pl. xxiv, figg. 1 & 2; xxxi, figg. 4 & 5.
Stoichactis, n. g.,
S. kenti, H. & S., pl. xxxi, figg. 6 & 7.
S. haddoni, S.-Kent, pl. xxxi, fig. 8.

? *Discosoma mummiiforme*, Leuck.

? *D. rubraoris*, S.-Kent.

Discosomoides, n. g.

Rhodactis howesii, S.-Kent.

Actinotryx bryoides, H. & S., pl. xxv, figg. 1-3; pl. xxxii, figg. 7-9.

A. muosoides, S.-Kent.

Cryptodendrum adhesivum, Klunz, pl. xxv, figg. 4-6; pl. xxxii, figg. 5 & 6.

Heterodactyla hemprichii, Ehr.

H. hypnoides, S.-Kent.

Actinaria dendrophora, H. & S., pl. xxv, figg. 7-9; pl. xxxii, figg. 1-4.

Actinodendron plumosum, n. sp., pl. xxiv, figg. 3-6.

A. glomeratum, n. sp., pl. xxiv, figg. 7-9.

Megalactis griffithsi, S.-Kent.

Phymanthus muscosus, H. & S., pl. xxv, figg. 10-14; pl. xxxi, fig. 9.

Incert. sedis.

Physobrachia douglasi, S.-Kent. Perhaps a variety of *Anemonia ramsayi*, H. & S., p. 420; HADDON (117).

MADREPORARIA.

BERNARD (25) discusses the morphology and taxonomy of the *Montiporinæ*, and illustrates the structure of the Montiporine corallum with diagrams. He proposes the following classification of the *Madreporidæ* :—

Fam. *Madreporidæ*.

Subfam. I. *Madreporinæ*.

Genera *Madrepora*.

Turbinaria.

Astræopora.

Subfam. II. *Montiporinæ*.

Genera *Montipora*.

Anacropora.

BERNARD (23) has also completed the third instalment of the catalogue of the Madreporarian Corals in the British Museum. The numerous species of *Montipora* are arranged in the following groups :—

Montipora.

I. Glabrous.

(a) explanate.

M. exigua, subtilis, granulosa, stratiformis, explanata, tenuissima, porosa, reticulata, crassireticulata, pallida, punctata, complanata, auricularis, exserta, glabra.

(b) rising into lobes.

M. obtusata, bolsii, erosa?, solida, spongodes, divaricata, mollis.

(c) ramose.

M. levis, compressa, alcornis, fruticosa, spicata, rubra, superficialis, nana, digitata, tortuosa.

II. Glabro-foveolate.

M. ramosa, rotunda, spatula, marenzelleri.

III. Foveolate.

M. libera, turgescens, foveolata, socialis, caliculata, calcarea, irregularis, multiformis, angulata, gaimardi, indentata, palmata, rigida, limitata, pilosa, profunda, caliculata var. piriformis.

IV. Papillate.

(a) papillæ irregular.

M. venosa, spumosa, ænigmatica, brueggemanni, lanuginosa, flammans, lobulata, edwardsi, acanthella, fungiformis, alveopora, saxea.

(b) papillæ as hoods or underlips.

M. bilaminata, guppyi, tubifera, crista-galli, gracilis, spongiosa, circumvallata, stalagmites.

(c) papillæ in series.

M. papillosa, denticulata, pulcherrima, prolifera, australiensis, patinæformis, undata, viridis.

(d) papillæ nipple-shaped.

M. planiuscula, mæandrina, danæ, verrucosa, ambigua, mam-mifera, sinensis, abrotanoides, fragosa, tuberculosa.

V. Tuberculate.

(a) tubercles simple.

M. perforata, scabricula, variabilis, annularis, stilosa, villosa, nodosa, mammillata, cactus, incrustans, stellata, inconspicua, challengerii, listeri, grisea, minuta, lichen, scutata, pettiformis, granulata, æquituberculata, expansa, incognita, phrygiana, informis, hispida, tuberosa, monasteriata, friabilis, aspera, fragilis, myriophthalma, granifera, willeyi.

(b) tubercles in ridges, etc.

M. rus, crassituberculata, amplexans, patula, effusa, frondens, trabeculata, ellisi, efflorescens, fimbriata, solanderi, striata, circinata, foliosa, crassifolia, plicata, hirsuta, bifrontalis.

Anacropora forbesi, gracilis, erecta, reptans, solida, spinosa; BERNARD (23).

GARDINER (96) describes the following Perforate Corals from the S. Pacific (mostly from Funafuti and Rotuma):—

Astræopora tabulata, n. sp., pl. xxiii, fig. 4; *Madrepora crateriformis*, pl. xxiii, fig. 1; *M. rotumana*, n. sp., pl. xxiii, fig. 2; *M. profunda*, n. sp., pl. xxiii, fig. 3; *Montipora columnaris* Bernard, n. sp., pl. xxiii, fig. 5; *Porites alveolata* Edw. & H., pl. xxiv, fig. 1a; *P. viridis*, n. sp., pl. xxiv, figg. 1b & 2; *P. viridis*, var. *apalata*, pl. xxiv, fig. 1c; *P. purpurea*, n. sp., pl. xxiv, figg. 1d & 3; *P. trimurata*, n. sp., pl. xxiv, figg. 1e & 4; *P. umbellifera*, n. sp., pl. xxiv, figg. 1f & 5; *Porites parvistellata* Quelch, pl. xxiv, fig. 1g, Rotuma; *P. arenosa* Esper., pl. xxiv, figg. 1h & 6, Funafuti; *P. arenosa*, var. *lutea*, pl. xxiv, fig. 1k; *P. arenosa*, var. *parvicellata*, pl. xxiv, fig. 1l, Funafuti; *P. superfusa*, pl. xxiv, figg. 1m & 7, Funafuti; *P. exilis*, n. sp., pl. xxiv, figg. 1n & 8, Funafuti, Rotuma; *Turbinaria schistica*, n. sp., pl. xxiv, fig. 9.

GARDINER (97) describes the following Fungid Corals from the S. Pacific:—

Halomitra irregularis, n. sp., pl. xliii, figg. 1 & 2; *Pavonia intermedia*, n. sp., pl. xlv, fig. 3; *P. calicifera*, n. sp., pl. xlv, fig. 4; *Psammocora superficialis*, n. sp., pl. xlv, fig. 2; *P. profundacella*, n. sp., pl. xlv, fig. 3; *P. savigniensis*, n. sp., pl. xlv, fig. 4; *Siderastræa clavus* Dana, pl. xlv, fig. 1.

LACAZE-DUTHIERS (153) monographs the *Zoantharia sclerodermata* of the Gulf of Lyons; the following species are described in detail:—

Amphihelia oculata, pl. viii, figg. 1–7; *Balanophyllia regia*, pls. x & xi; *B. italica*, pl. x, figg. 31–33; *Caryophyllia cyathus*, pl. v, figs. 1–3; *C. clavus*, pl. i, figg. 1–15, pl. ii; *C. smithii*, pls. ii & iii; *C. arcuata*, pl. v, figg. 4–8; *Cladopsammia*, n. gen. of *Eupsammia*; *C. rolandi*, n. sp., pl. xi, figg. 1–7; *Cænocyathus cylindricus*, pl. v, figg. 13–15; *C. mouchezii*, n. sp., pl. v, figg. 10–12; *Dendrophyllia cornigera*, pl. xi, fig. 8; *D. ramea*, pl. xii, fig. 8; *Desmophyllum cristagalli*, pl. vi, figg. 7–11; *Flabellum anthophyllum*, pl. vi, figg. 12 & 13; *Leptopsammia pruvoti* L. D., pl. xi, figg. 9–12; *Lophohelia prolifera*, pl. v, figg. 8–14; *Paracyathus striatus et pulchellus*, pl. vi, figg. 1–6.

OGILVIE (180A) describes and figures the microscopic structure characteristic of the following types of corals:—*Galaxea*, *Fungia*, *Heliastrea*, *Goniastrea*, *Turbinaria*, *Montivallia*, *Eupsammia*, *Siderastrea*, *Actinacis*, *Stylophyllum*, *Madrepora*, *Porites*, *Heptastylis*.

Skeleton ; STRUVE (219); evolutionary stages of ; BERNARD (24).

Alveopora (figures) has affinities with the Palæozoic *Favositidæ*, but *Alveopora* and *Poritidæ* are very far apart ; BERNARD (24).

Cariophyllia smithii, anatomy and histology ; ARNESEN (12).

Caryophyllia cyathus, development ; KOCH (146).

Cladocora cespitosa, anatomy ; ARNESEN (12).

Dendrophyllia axifuga, photograph ; SAVILLE-KENT (202).

D. ramea, anatomy and histology ; ARNESEN (12).

Madrepora corymbosa, *M. proteiformis*, *M. hebes* ; ARNESEN (12).

Madrepora botryodes, var. *funafutiensis*, n. var. ; WHITELEGGE (243).

M. spinulifera, n. sp., *M. impressa*, n. sp. ; WHITELEGGE (243).

Madrepora echidnæa, Lmk., and *M. surculosa*, Dana, budding and colony formation (figg.) ; KOCH (145).

M. palmata, remarkable specimen ; WHITFIELD (244).

Madrepore reef, Pelsart Island Lagoon, Chromolithograph plate ; SAVILLE-KENT (202).

Montipora circinata, Houtman's Abrolhos, photograph ; SAVILLE-KENT (202).

Pocillopora septata, n. sp., Funafuti, 30 fath., pl. lvi, figg. 5 & 5a ; *P. clavarica*, Ehrenberg, fig. 1, pl. lvii ; *P. obtusata*, n. sp., pl. lvi, fig. 2 ; *P. favosa*, Ehrenberg, Funafuti, 7-8 fath., pl. lvi, fig. 3 ; *P. aspera*, Verrill ; *P. coronata*, n. sp., pl. lvi, figg. 4 & 4a ; *P. rugosa*, n. sp., pl. lvii, fig. 2 ; *P. glomerata*, n. sp., pl. lvi, fig. 1 ; GARDINER (98).

Turbinaria conspicua, *peltata*, *revoluta*, photographs by SAVILLE-KENT (202).

Ulocyathus arcticus, anatomy and histology ; ARNESEN (12).

FOSSIL CORALS.

KOBY (143), in his monograph of the Cretaceous Fauna of Switzerland, includes:—

Astrocaenia jaccardi, Koby, 1897, Morteau, Urgonien.

Leptophyllia baumbergeri, Koby, 1897, Valangin, Valengien inférieur.

Cyclolites aptiensis, Fromentel, Perte du Rhone, Aptien ; *C. schardti*, Koby, 1897, Bossetan, Aptien.

Thecoseris convoluta, Koby, 1897, La Presta, Aptien ; *T. pumila*, Koby, 1897, La Presta, Aptien.

Latiphyllia neocomiensis, Fromentel.

Dimorphastrea crassisepta, d'Orbigny, Käsernalp, Morteau, Urgonien ; *D. alpina*, Koby, 1896, Bannalp, Neocomian ; *D. bellula*, d'Orbigny, Morteau, Urgonien.

Thamnastrea duparci, Koby, 1897, Käsernalp, Urgonien ; *T. frondescens*, Fromentel, Sainte-Croix, Neocomian ; *T. dupasquieri*, Koby, 1897, Morteau, Urgonien ; *T. mæandra*, d'Orbigny, Morteau, Urgonien ; *T. favrei*, Koby, 1897, Morteau, Urgonien ; *T. urgonensis*, Koby, 1897, Morteau, Urgonien.

Microsolena guttata, Koby, 1897, Morteau, Urgonien.

Polyphyloseris convexa, d'Orbigny, Morteau, Urgonien.

Mæandrarea mæandroides, Koby, 1897, Morteau, Urgonien.
Thamnarea cancellata, Koby, 1897, Morteau, Urgonien.
Pleurosmilia barottei, Fromentel, Villers, Valengien; *P. villersensis*, Koby, 1897, Les Cléas, Valengien.
Stylosmilia gracilis, Fromentel, Vuache, Villers, Valengien.
Stylohelix jaccardi, Koby, 1896, Morteau, Urgonien.

KONINCK (147) describes the following Palæozoic species of New South Wales:—

Aulopora fasciculata, Bell River, Silurian.
Alveolites rapa, Burrawang, Silurian; *A. obscurus*, n. sp., Yass, Devonian.
Striatopora australica, Yass, Silurian.
Amplexus selwyni, Yass, Devonian.
Cœnites expansus, Yass, Devonian.
Billingsia, n. gen.; *B. alveolaris*, n. sp., Yass, Devonian.
Syringopora auloporoides, n. sp., Moara Creek, Devonian; *S. reticulata*, Goldfuss, Carboniferous.
Axophyllum? *Thomsoni*, n. sp., Colocolo, Carboniferous.
Lithostrotion irregulare, Phillips; *L. basaltiforme*, W. B. Conyb. & Phillips.
Cyathophyllum inversum, n. sp., Colocolo, Carboniferous.
Lophophyllum minutum, n. sp., Burragood, Carboniferous; *L. corniculum*, n. sp., Colocolo, Carboniferous.
Zaphrentis gregoryana, n. sp., Colocolo, Carboniferous; *Z. cainodon*, *robusta*, nn. spp., Burragood, Carboniferous.
Cyathaxonia minuta, n. sp., Burragood, Carboniferous.
Cladochonus tenuicollis, McCoy, Burragood, Carboniferous.
Favosites ovata, Lonsdale (= *Stenopora ovata*, Lonsdale), Burragood, Carboniferous.

OSASCO (184) describes the following from the Miocene of Piedmont:—

Leiopathes vetusta, Michn., var. *ornata*, n. var.
Eupsammia sismondiana, Michn., var. *producta*, n. var.; *E. trochiformis*, Brong., var. *magna*, n. var.
Balanophyllia vagans, Micht., var. *subprælonga*, n. var.; *B. conica*, n. sp.
Dendrophyllia subirregularis, n. sp.; *D. digitalis*, Blainv., var. *minor*, n. var.; *D. digitalis*, Blainv., var. *subtaurinenensis*, n. var.
D. taurinenensis, E. H., var. *triserialis*, var. *subramea*, nn. vars.; *D. incerta*, n. sp.
Siderastræa miocenica, n. sp.
Heliastræa delicata, n. sp.; *H. fragilis*, n. sp.; *H. æqualicostata*, n. sp.; *H. incerta*, n. sp.; *H. incrustans*, n. sp.
Trochosmilia pedemontana, Micht. in schedis.
Cariophyllia æqualis, Micht. in schedis.
Trochocyatus pyramidatus, Micht., var. *subperarmata*, n. var.; *T. armatus*, Micht., var. *quatuorspina*, n. var.; *T. lævicostatus*, n. sp.; *T. lævicostatus*, Osc., var. *spinosa*, n. var.; *T. baseornatus*, n. sp.; *T. planulatus*, n. sp.; *T. crassus*, Micht., var. *subarmata*, var. *diversiformis*, nn. vars.; *T. bellingerianus*, Michn., var. *crestata*, n. var.
Desmophyllum bilobatum, n. sp.; *D. exclavatum*, Micht., var. *magna*, n. var.; *D. conulatum*, *D. productum*, *D. lævicostatum*, *D. formæ*, *D. sp.*?, nn. spp.
Amphyhelix ambigua, Sism., var. *neglecta*, Micht.
Flabellum fecundum, Micht., var. *dertonensis*, n. var.; *F. sinense*, Micht., var. *costulata*, n. var.
Rhizotrochus anomalus, n. sp.

OGILVIE (179) has monographed the Corals of Stramberg.

The following species are described and are recorded from the following localities :—

	Tithon		Portlandien	Kimmeridgien		Sequanien
	Stramberg, Koniakau, Kotzobenz, Wischlitz	Mte. Cavallo, Mte. Pastello etc.	Mantoché, Gray-la-Ville, Wimmis, Mont Saleve	Nattheim, Beiningen, Sirehingen etc.	Valfin, Oyonnax, Porrentruy, St. Claude, Waldeck (Virgulien et Ptérocerien)	Bressaucourt, Vieille Route, Hochwald, Locle, St. Croix, St. Mihiel, Soynières, Caguerelle, Champplitte (Astartien et Rauracien)
Fam. <i>Amphiastræidæ</i>						
OGILVIE.						
<i>Opisthophyllum</i> new genus						
<i>O. Zitteli</i> OGILVIE	+	—	—	—	—	—
<i>O. vesiculare</i> OGILVIE	+	—	—	—	—	—
<i>O. minimum</i> OGILVIE	+	—	—	—	—	—
<i>Amphiastræa gracilis</i> Koby	+	—	—	—	—	+
<i>A. cylindrica</i> OGILVIE	+	—	—	—	—	—
<i>Aulastræa</i> , new genus						
<i>A. Schäferi</i> OGILVIE	++	—	—	—	—	—
<i>A. conferta</i> OGILVIE	+	—	—	—	—	—
<i>Sclerosmilia Strambergensis</i>						
OGILVIE	+	—	—	—	—	—
<i>Pseudothecosmilia Étalloni</i> Koby	+	—	—	—	—	+
<i>Stylosmilia excelsa</i> Koby sp.	+	—	—	—	—	+
<i>S. kobyi</i> OGILVIE						
<i>S. rugosa</i> BECKER sp.	++	+	—	+	—	+
<i>S. Koniakensis</i> OGILVIE	++	—	—	—	—	—
<i>Selenogyra</i> new genus						
<i>S. Geikiei</i> OGILVIE	+	—	—	—	—	—
<i>Aplosmilia rugosa</i> Koby	+	—	—	—	—	—
<i>Dendrogyra sinuosa</i> OGILVIE	+	—	—	—	—	—
<i>Rhipidogyra flabellum</i> MICH. sp.	++	—	—	—	+	+
<i>R. percrassa</i> ÉTALL.	+	—	—	—	+	+
<i>R. minima</i> Koby	+	—	—	—	+	—
<i>Acanthogyra</i> , new genus						
<i>A. columnaris</i> OGILVIE	+	—	—	—	—	—
<i>A. multiformis</i> OGILVIE	+	—	—	—	—	—
<i>A. subcompressa</i> OGILVIE	+	—	—	—	—	—
Fam. <i>Turbinolidæ</i> E. H. em.						
OGILVIE.						
<i>Pleurosmilia cylindrica</i> FROM.	++	—	+	+	—	—
<i>P. Marcou</i> ETALL.	+	—	—	—	+	+
<i>P. crassa</i> MILASCH.	+	—	+	+	—	—
<i>P. aff. infundibuliformis</i> MI-						
LASCH.	+	—	—	+	—	—
<i>Epismilia obesa</i> Koby	+	—	—	—	—	+
<i>E. reptilis</i> MILASCH.	+	—	—	+	—	—
<i>E. cuneata</i> MILASCH.	+	—	—	+	—	—

	Tithon		Portlandien	Kimmeridgien		Sequanien
	Stramberg, Koniakau, Kotzobenz, Wischlitz	Mte. Cavallo, Mte. Pastello etc.	Mantoche, Gray-la-Ville, Wimmis, Mont Salève	Nattheim, Beinigen, Sirchingen etc.	Valfin, Oyonnax, Porrentruy, St. Claude, Waldeck (Virgulien et Ptérocerien)	Bressaucourt, Vieille Route, Hochwald, Locle, St. Croix, St. Mihiel, Soyhières, Caquerelle, Champlitte (Astartien et Rauracien)
Fam. Oculinidæ EDW. u. H.						
<i>Dendrohelia coalescens</i> GOLDF.						
sp.	+	—	—	+	—	+
<i>Goniocora Haimeï</i> FROM. . .	+	—	—	—	—	+
<i>G. dubia</i> KOBY	+	—	—	—	—	+
Fam. Pocilloporidæ VERRILL.						
<i>Astrocœnia crasso-ramosa</i> MICH.						
sp.	+	—	—	—	+	—
<i>A. Bernensis</i> KOBY	++	+	—	—	+	+
<i>A. Delemontana</i> KOBY . . .	+	—	—	—	+	—
<i>Stephanocœnia favulus</i> THURM.						
sp.	+	—	—	—	+	+
Fam. Madreporidæ DANA.						
<i>Thamnarœa arborescens</i> ÉTALL.	+	—	—	—	—	+
<i>T. pulchella</i> OGILVIE	+	—	—	—	—	—
Fam. Stylinidæ KLZ.						
<i>Diplocœnia clathrata</i> ÉTALL. sp.	+	—	—	—	+	—
<i>D. spissa</i> BECKER sp. . . .	+	+	—	+	—	—
<i>D. Inwaldensis</i> OGILVIE . . .	+	—	—	—	—	—
<i>D. multiseptata</i> OGILVIE . . .	+	—	—	—	—	—
<i>Heliocœnia dendroidea</i> ÉT. . .	+	—	—	—	+	—
<i>H. Humberti</i> ÉT.	+	—	—	—	+	—
<i>Stylina granulosa</i> FROM. . .	+	—	+	—	—	—
<i>S. arborea</i> D'ACH.	+	+	—	—	—	—
<i>S. Kotzobensis</i> OGILVIE . . .	+	—	—	—	—	—
<i>S. foliosa</i> OGILVIE	+	—	—	—	—	—
<i>S. sulcata</i> FROM.	+	—	+	—	—	—
<i>S. tuberosa</i> OGILVIE	+	—	—	—	—	—
<i>S. anthemoides</i> MENEGH. sp. .	+	+	—	—	—	—
<i>S. Waldeckensis</i> ÉT.	+	—	—	—	+	—
<i>S. parvipora</i> OGILVIE	+	—	—	—	—	—
<i>S. milleporacea</i> OGILVIE . . .	+	—	—	—	—	—
<i>S. tubulifera</i> PHILIPPS sp. . .	+	—	—	—	+	+
<i>S. brevicosta</i> OGILVIE	+	—	—	—	—	—
<i>Cyathophora Claudiensis</i> ÉT. .	++	—	—	+	+	+
<i>C. Bourgueti</i> DEFR. sp. . . .	++	—	+	+	+	+
<i>C. globosa</i> OGILVIE	+	—	—	—	—	—
<i>C. tithonica</i> OGILVIE	+	—	—	—	—	—
<i>Cryptocœnia compressa</i> KOBY .	+	—	—	—	+	—
<i>C. Thiessingi</i> KOBY	+	—	—	—	—	+
<i>Convexastrœa minima</i> ÉT. sp.	+	—	—	—	—	+
<i>C. sexradiata</i> GOLDF. sp. . .	+	—	+	+	+	+

	Tithon		Portlandien	Kimmeridgien		Sequanien
	Stramberg, Koniakau, Kotzobenz, Wischlitz	Mte. Cavallo, Mte. Pastello etc.	Mantoche, Gray-la-Ville, Wimms, Mont Salève	Nattheim, Beiningen Sirehingen etc.	Valfin, Yonnax, Porrentruy, St. Claude, Waldeck (Virgulien et Pterocerien)	Bressaucourt, Vieille Route, Hochwald, Locle, St. Croix, St. Miniel, Soyhières, Caquerelle, Champlitte (Astartien et Rauracien)
Fam. Astræidæ E. H. em.						
OGILVIE.						
<i>Isastræa undans</i> ÉT. sp. . . .	++	—	—	—	+	—
<i>I. variabilis</i> ÉT. sp.	+	—	—	—	+	+
<i>I. Thurmanni</i> ÉT. sp.	+	—	—	—	—	+
<i>I. Goldfussi</i> Koby sp.	+	—	—	—	+	—
<i>I. Gourdani</i> FROM.	+	—	+	—	—	—
<i>I. minima</i> Koby sp.	+	—	—	—	—	+
<i>I. cylindrica</i> OGILVIE	+	—	—	—	—	—
<i>Montlivaltia obconica</i> MSTR. sp.	+	—	+	—	—	—
<i>M. crassisepta</i> FROM.	+	—	+	+	+	—
<i>M. nidiformis</i> MILASCH. . . .	+	—	—	+	—	—
<i>M. Renevieri</i> Koby	+	—	—	—	—	+
<i>M. Cavali</i> D'ACH.	+	+	—	—	—	—
<i>M. alata</i> OGILVIE	+	—	—	—	—	—
<i>Thecosmilia Koniakensis</i> OGILV.	++	—	—	—	—	?
<i>T. longimana</i> QUENST. sp. . .	++	—	—	+	+	+
<i>T. virgulina</i> ÉT. sp.	+	—	—	—	+	—
<i>T. flabella</i> BLAINV. sp.	+	—	—	—	+	—
<i>T. irregularis</i> ÉT.	+	—	—	—	+	—
<i>T. Volzi</i> OGILVIE	+	—	—	—	—	—
<i>T. trichotoma</i> GOLDF. sp. . .	+	—	+	+	—	+
<i>T. Langi</i> Koby	+	—	—	—	—	+
<i>T. suevica</i> QUENST. sp. . . .	++	—	—	+	+	—
<i>T. Moraviensis</i> OGILVIE . . .	+	—	—	—	—	—
<i>T. truncata</i> OGILVIE	+	—	—	—	—	—
<i>Rhabdophyllia disputabilis</i>						
BECKER sp.	++	—	—	+	—	—
<i>R. cervina</i> ÉT.	+	—	—	—	—	+
Fam. Fungidæ DANA em.						
OGILVIE.						
Subf. Thamnastræinæ REUSS						
em. PRATZ.						
<i>Leptophyllia cyclolites</i> QUENST.						
sp.	+	—	—	+	—	—
<i>L. Thurmanni</i> Koby	+	—	—	—	—	+
<i>Thamnastræa confluens</i> QUENST.	++	—	—	+	—	—
<i>T. oculata</i> Koby	+	—	—	—	—	+
<i>T. gibbosa</i> BECKER	+	—	—	+	—	—
<i>T. aspera</i> OGILVIE	+	—	—	—	—	—
<i>T. aff. Lomontiana</i> ÉT.	+	—	—	—	—	+
<i>T. globosa</i>						
<i>Dimorphastræa heteromorpha</i>						
QU. sp.	+	—	—	+	—	—
<i>D. conica</i> Koby	+	—	—	—	—	+

	Tithon		Portlandien	Kimmeridgien		Sequanien
	Stramberg, Koniakau, Kotzobenz, Wischlitz	Mte. Cavallo, Mte. Pastello etc.	Mantoche, Gray-la-Ville, Wimmis, Mont Salève	Nattheim, Beiningen, Sirchingen etc.	Valfin, Oyonnax, Porrentruy, St. Claude, Waldeck (Virgulien et Pérocerien)	Bressaucourt, Vieille Route, Hochwald, Locle, St. Croix, St. Mihiel, Soyhières, Caquerelle, Champlitte (Astarien et Rauracien)
<i>D. dubia</i> FROM.	+	—	—	+	—	—
<i>D. vasiformis</i> Koby	+	—	—	—	—	+
<i>Microsolena tuberosa</i> MICH. sp.	+	—	—	—	+	—
<i>M. agariciformis</i> Ét.	+	—	—	—	+	—
<i>M. cf. Bouri</i> FROM.	+	—	+	—	—	—
<i>M. variata</i>						
<i>M. exigua</i> Koby	++	—	—	—	—	+
<i>M. stellata</i> OGILVIE	+	—	—	—	—	—
<i>Polyphylloseris corticata</i> OGILV.	++	—	—	—	—	—
<i>P. tenuiseptata</i> OGILVIE . . .	+	—	—	—	—	—
<i>P. fascicularis</i> OGILVIE . . .	+	—	—	—	—	—
<i>P. ramosa</i> OGILVIE	+	—	—	—	—	—
<i>Dimorpharæa Koechlini</i> HAIME sp.	++	—	—	—	—	+
<i>Mæandraræa tuberosa</i> Ét. . . .	+	—	—	—	+	—
<i>M. laminata</i> OGILVIE	+	—	—	—	—	—
Subfam. Funginæ E. H.						
<i>Thamnoseris Montipastelli</i> D'ACH sp.	+	+	—	—	—	—
<i>T. Amedei</i> Ét sp.	+	—	—	—	—	+
<i>T. Perroni</i> FROM.	+	—	+	—	—	—
<i>T. Strambergensis</i> OGILVIE . .	+	—	—	—	—	—
Subfam. Lophoserinæ E. H.						
<i>Protoseris robusta</i> BECKER . .	+	—	—	+	—	—
<i>P. recurvata</i> OGILVIE	+	—	—	—	—	—
<i>Comoseris brevivallis</i> OGILVIE .	+	—	—	—	—	—
Fam. Eupsammidæ E. H. em. OGILVIE.						
<i>Epistreptophyllum commune</i> MIL.	+	—	—	+	—	+
<i>E. conicum</i> OGILVIE	+	—	—	—	—	—
<i>R. Montis</i> FROM. sp.	+	—	—	—	—	+
<i>Diplaræa simplex</i> Koby sp. . .	+	—	—	—	—	+
<i>D. laxata</i> Ét. sp.	+	—	—	—	—	+
<i>D. subcrassa</i> Koby sp.	+	—	—	—	—	+
<i>D. rugosa</i> Koby sp.	+	—	—	—	—	+
<i>D. nobilis</i> OGILVIE	+	—	—	—	—	—
<i>Haplaræa columnaris</i> OGILVIE	+	—	—	—	—	—

OSASCO (185), Oligocene corals from Piedmont and Liguria.
 OSSAT (186); Palæozoic fauna of the Alpi Carniche.
 OSSAT & NEVIANI (187); Neogenic corals of Sardinia.
 SIMONELLI (211) describes Neogenic corals in the Parma Museum.

RUGOSA.

Cyathaxonidæ.

Cyathaxonia cornu, Mich.; OSSAT (186).
Petraia, sp. ind. (fig.), Upper Silurian, Victoria; DUN (78).
P. benediniana, Konck.; OSSAT (186).
Polycaelia profunda, Germar. (fig.); STUCKENBERG (220).

Zaphrentidæ.

Phylogeny, diagrams showing origin of bilateral arrangement of septa;
 WEISSERMEL (236).

Amplexus westii, n. sp., Carboniferous, Kansas; BEEDE (18).
A. ? rockfordensis, n. sp., Palæozoic, Indiana; MILLER & GURLEY (168).
Lophophyllum proliferum, M'Ches., *L. tortuosum*, Mich., *L. breve*, Koch,
L. ? dumonti, E. H.; OSSAT (186).
Streptelasma profundum, Owen, *S. corniculum*, Hall; SARDESON (201).
Zaphrentis beyrichi, Rothpletz? FRECH (92).
Z. ? sp., Devonian, Asia Minor; KAYSER (140).
Z. permocarbonicus, n. sp. (fig.), Russia.
Z. sp. (fig.); STUCKENBERG (220).
Z. humilis, n. sp., *Z. varians*, n. sp., *Z. acuticornis*, n. sp., *Z. limatus*, n. sp.,
 Indiana; GREENE (105).
Z. omaliusi, E. H.; OSSAT (186).

Cyathophyllidæ.

Phylogeny, diagrams showing origin of bilateral arrangement of septa;
 WEISSERMEL (236).

Aulophyllum fungites, Flem.; OSSAT (186).
Campophyllum torquinum, Owen; BEEDE (17).
C. compressum, Ludw.; OSSAT (186).
Caninia koksharowi, Stuck., *C. sp.*; OSSAT (186).
Clisiophyllum pironai, n. sp.; OSSAT (186).
Columnaria pauciseptata, n. sp., Upper Silurian, New South Wales;
 ETHERIDGE (82).
C. kassariensis, Dyb., p. 871, figg. 1 *a*, *b*; WEISSERMEL (236).
Cyathophyllum elegantulum, n. sp., *C. mansfieldense*, n. sp. (figg.), Upper
 Silurian, Victoria; DUN (78).
C. loczyi, n. sp.; FRECH (92).
C. cfr. konincki, E. H.; OSSAT (186).
Endophyllum schlüteri, n. sp., Lower Palæozoic, Isis River, Brisbane;
 ETHERIDGE (85).
Heliophyllum osculatum, n. sp., *H. nanum*, n. sp., *H. tumidulum*, n. sp.,
 Indiana; GREENE (105).
Lithostrotion junceum, Flem., *L. irregulare*, Phill.; OSSAT (186).
Lonsdaleia, sp.; FRECH (92).
Monopteris gibbosa alata, n. var.; BEEDE (17).
Phryganophyllum karpinkyi, n. sp. (fig.); STUCKENBERG (220).

HEXACORALLA (ZOANTHARIA).

APOROSA.

Turbinolidæ.

Turbinolid coral from Skála Petaliki, Tertiary, N. Greece, pl. ii, figg. 7 & 8 ; PENECKE (191).

Deltocyathus italicus, Micht., Middle Miocene, Kostej, Banat ; BOETTGER (30).

Flabellum victoriae, Dunc. ; *F. candaneum*, E. & H. ; *Notocyathus excisus*, Dunc. ; *N. australis*, Dunc. ; *Placotrochus deltoideus*, Dunc. ; *P. elongatus*, Dunc., Tertiary, Australia ; HALL & PRITCHARD (124).

F. carcarense, n. sp., Oligocene, N. Italy ; OSASCO (185).

F. extensum, Michl., Neogenic, Sardinia ; OSSAT & NEVIANI (187).

Paracyathus supracostatus, n. sp., Eocene, Shelford, Australia, pl. xx, figg. 2a, b ; DENNANT (67).

P. cæruleus, Duncan, Miocene, Yenangyat and Minbu, Burma ; NOETLING (176).

Stylotrochus (sub-genus of *Turbinolia*) ; *S. volzi*, n. sp. (fig.), Turonian, Groschowitz ; LEONHARD (157).

Trochocyathus canavarii, d'Ach., pl. iv, Monte Serra ; CANAVARI (44).

Cænocyathus affinis, n. sp. ; *Ceratotrochus subrectus*, n. sp. ; *Caryophyllia neglecta*, *C. revoluta*, *C. granulosa*, nn. spp. ; *C. inflata*, Seg. ; *Desmophyllum elatum*, n. sp. ; *D. ambiguum*, Michtti. ; *D. simplex*, Michtti. ; *Paracyathus turonensis*, E. H. ; *Deltocyathus cylindricus*, Michtti. ; *Trochocyathus subcristatus*, E. H. ; *Flabellum majus*, E. H. ; *F. sici-liense*, E. H., Tertiary, N. Italy ; ANGELIS (10).

SIMONELLI (211) describes the following Neogenic forms :—

Flabellum vaticani, Ponzi ; *F. extensum*, Michn., var. *placentina*, n. var. ; *F. avicula*, Michn., sp. ; *F. avicula*, vars. *Royssiana*, M. Edw. & H. ; *ponderosa*, n. var., *siciliensis*, M. E. & H. ; *micelinii*, M. E. & H. ; *parmensis*, Mgh. ; *F. bagattii*, n. sp., *F. manzonii*, n. sp. ; *Trochocyathus affinis*, Reuss ; *T. mitratus*, Goldf., sp. ; *T. strobili*, n. sp. ; *T. patelliformis*, n. sp. ; *Stephanocyathus elegans*, Seg. ; *Paracyathus pedemontanus*, Michn., sp. ; *Caryophyllia clavus*, Scacchi ; *C. felsinea*, Sim. ; *C. polymorpha*, Seg., sp. ; *C. communis*, Seg., sp. ; *Ceratotrochus multispinosus*, Micht., sp. ; *C. multiserialis*, Micht., sp. ; *C. duodecimcostatus*, Goldf., sp. ; *C. duodecimcostatus*, var. *trigona*, n. var.

Stylophoridæ.

Stylophora asymmetrica, n. sp., Middle Miocene, Helvetian, Egypt, pl. viii, figg. 4a-c ; *Stylophora similis* (Mayer-Eymar), Upper Eocene, Fayum, pl. viii, fig. 6 ; GREGORY (106) ; *S. micropora*, Michtti. ? Neogenic, Sardinia ; OSSAT & NEVIANI (187).

Astrœidæ.

Astrocænia decaphylla, E. & H., fig., Cenomanian, Groschowitz ; LEONHARD (157).

A. ramosa, M. Edw. et H. (Sow. sp.), p. 249, pl. xi, fig. 2 ; *A. decaphylla*, M. Edw. et H. (Michelin sp.), p. 251, pl. xi, fig. 1 ; *A. konincki*, M. Edw. et H. ; drawings of sections ; FELIX (88).

Astrocæninæ ; FELIX (88).

- Calamophyllia grandis*, n. sp., Tertiary, Haskovo, pl. iii, figg. 2-6; *C. minima*, n. sp., Haskovo, pl. iii, figg. 7-9; BONTSCHEFF (33).
Circophyllia cylindroides, Reuss, Tertiary, Haskovo, pl. iii, fig. 1; BONTSCHEFF (33).
Cælosmilia milneri, n. sp., Libyan series, pl. viii, figg. 1-3; GREGORY (106).
Columnastræa striata, M. Edw. & H. (Goldf. sp.), p. 254, pl. xi, fig. 3, diagram of section; FELIX (88).
C. elegans, n. sp., Haskovo, pl. iv, figg. 1 & 2; BONTSCHEFF (33).
Cyathophora heliolitiformis, n. sp., Weisser Jura, Toplalu, fig. 2, p. 59; WEISSERMEL (236).
Isastræa, sp., Cenomanian, Groschowitz; LEONHARD (157).
Montlivaultia variformis, n. sp., Eocene, Table Cape, Tasmania, pl. xx, figg. 1a, b; DENNANT (67).
Orbicella schweinfurthi (Felix), Helvetian, Egypt; GREGORY (106).
Parasmilia centralis, Mant., Oppeln, Turonian; LEONHARD (157).
Phyllocænia toucasi, De From., var. *Ægyptiaca*, n. var., Turonian near Gizeh, pl. ix, figg. 1 & 2; GREGORY (106).
Plesiastrea microcalyx (Felix), Helvetian, Egypt, pl. viii, figg. 5a, b; GREGORY (106).
Solenastræa turonensis (Mich.), Helvetian, Egypt; GREGORY (106).
Stephanocænia formosa, M. Edw. & H. (Goldf. sp.), p. 252, pl. xi, fig. 4, diagram of section; FELIX (88).
Trochosmilia protectans, n. sp., Upper Cretaceous, Mazár Drik; NOETLING (175).

The following are from the Tertiary of N. Italy:

- Phymastræa capellinii*, n. sp.; *Aphastræa adscita*, n. sp.; *Hydnophora crispata*, n. sp.; *H. scripta*, n. sp.; *Plerogyra deperdita*, *P. crassisepta*, nn. spp.; *Tridacophyllia contorta*, n. sp.; *Ulophyllia laxa*, n. sp.; *Symphyllia multisinuosa*, n. sp.; *Calamophyllia dissita*, n. sp.; *C. compressa*, n. sp.; *Phyllangia microsydereæ*, n. sp.; *Montlivaultia oblita*, n. sp.; ANGELIS (10).

OSASCO (185), Oligocene corals from Piedmont and Liguria:—

- Montlivaultia bormidensis*, E. H., var. *elata*, n. var.; *M. carcarenensis*, D'Arch. et Haim, var. *plana*, n. var.
Symphyllia vetusta, n. sp.; *S. cerebriiformis*, Micht.
Hydnophora minoris, n. sp.; *H. magnifica*, n. sp.; *H. meandrinoides*, Michn., var. *multisepta*, n. var.
Favia pulcherrima, Micht.; *F. minima*, n. sp.
Septastræa minuslamellata, n. sp.
Brachyphyllia crassa, n. sp.
Prionastræa intermedia, n. sp.; *Cladangia minor*, n. sp.
Stylastræa oligocenica, n. sp.; *S. pulchra*, n. sp.
Phyllocænia distincta, n. sp., N. Italy; OSASCO (185).

OSSAT & NEVIANI (187) describe from the Neogenic of Sardinia:—

- Solenastræa turonensis*, Michl.; *Cyathomorpha rocchettina*, Michelin; *Heliastrea defrancei*, E. H.; *Cladocora cæspitosa*, E. H.; *Lithophyllia basterotii*, E. H.; *Montlivaultia*, cf. *coronula*, Michtti.

SIMONELLI (211) adds notes on:—

- Cladangia conferta*, Reuss; *Cladocora granulosa*, Goldf., sp.; *Plesiastrea desmoulinsi*, M. E. & H.; *Siderastræa crenulata*, Goldf., sp.

Fungidæ.

- Cyathoseris crispa*, n. sp.; ANGELIS (10).
Fungia patella (Ell. & Sol.), var. *lobulata*, Klnz., Pleistocene Egypt; GREGORY (106).

- Halomitra ambigua*, n. sp.; ANGELIS (10).
Lophoseris anteacta, *L. prisca*, nn. spp.; ANGELIS (10).
Mycetoseris adscita, n. sp.; ANGELIS (10).

PERFORATA.

Eupsammidæ.

- Balanophyllia australiense*, Dunc.; HALL & PRITCHARD (124).
B. fallax, n. sp.?, Tertiary, N. Italy; ANGELIS (10).
B. guidotii, n. sp.; *B. cornucopia*, n. sp., Neogenic; SIMONELLI (211).
Dendrophyllia amica, Michti.; OSSAT & NEVIANI (187).
Eupsammia regalis, Alcock, Miocene, Yenangyat, Upper Burma; NOETLING (176).
E. contorta, *E. irregularis*, nn. spp., Tertiary, N. Italy; ANGELIS (10).
Heteropsammia antiqua, n. sp., Tertiary, N. Italy; ANGELIS (10).
Stephanophyllia imperialis, Michn., Neogenic; SIMONELLI (211).

Thamnastræidæ.

- Cyclolites medlicotti*, n. sp., Dés Valley; *C. regularis*, Leymerie, Somari Valley, Up. Cretaceous; NOETLING (175).
Thamnastræa adscita, n. sp.; ANGELIS (10).

Poritidæ.

- Not closely related to *Alveolites*; BERNARD (24).
Actinacis elongata, *A. lobata*, nn. spp., Tertiary, N. Italy; ANGELIS (10).
Alveopora discors, n. sp., Tertiary, N. Italy; ANGELIS (10).
Litharæa epithecata, Dunc., Libyan Series, Egypt, pl. viii, fig. 7, pl. ix, fig. 6; GREGORY (106).
Litharæa oblita, n. sp.; *L. eximia*, Meneg. in litt.; *L. michelotti*, Meneg. in litt.; ANGELIS (10).
Rhodoræa ambigua, n. sp.; *R. dissita*, n. sp., Tertiary, N. Italy; ANGELIS (10).
Porites incrustans, Defr.; SIMONELLI (211).

TABULATA.

- WEISSERMEL (234) gives reasons for not believing the *Tabulata* to be the ancestors of the *Alcyonaria*. He is therefore in disagreement with SARDESON (92, Zool. Rec. 1896).
Alveolites reticulatus, Steininger?; FRECH (92).
Diphyphyllum unicum, n. sp., Indiana; GREENE (105).
Favosites, relation to *Syringopora*; WEISSERMEL (235); relation to *Alveolites*; BERNARD (24).
F. asteriscus, n. sp.; *F. goldfussi*, M. Edw. & H., var. *major*, n. var.; FRECH (92).
F. ovata, Lonsdale (= *Stenopora ovata*, Lonsdale), Carboniferous, Burragood, N. S. Wales; KONINCK (147).
F. globosus, n. sp.; *F. rotundituba*, n. sp., Indiana; GREENE (105).
F. gothlandica, Lam., Upper Silurian, Victoria; DUN (78); figure; BERNARD (24).
F., sp. ind., Silurian, Catalonia; ANGELIS (9).
F. raripora, Frech, pl. xv, fig. 14; *F. hamiltonensis*, Hall, *forbesi* var. *waldronensis*, Nich., *raripora*, Frech, *polymorpha*, Goldf., figured diagrammatically in text; WEISSERMEL (235).
Halysites, recorded from New South Wales; ETHERIDGE (83).

- Heliolites porosus*, Goldf., fig. 3; *H. interstinctus*, L., fig. 4; WEISSERMEL (236).
Geinitzella columnaris, var. *ramosa sparsigemmata* (Schloth), Waagen; STUCKENBERG (220).
Michelinia minuta, n. sp., Indiana; GREENE (105).
M. minima, Stuck., Russia; STUCKENBERG (220).
M. tschihatschewi, J. Haime, Devonian, Pendik; KAYSER (140).
Monotrypa, sp. ind., Upper Silurian, Victoria; DUN (78).
Monticulipora, key to species of; *M. verrucosa*, n. sp., Savannah, Ills.; JAMES (137).
Monticulipora, n. sp., OSSAT (186); *M. tumida*, OSSAT (186).
Rhombopora bigemmis, Keyserl.; *R.*, sp., fig.; STUCKENBERG (220).
Plasmopora gervanensis, Nich. & Eth., section, p. 57; WEISSERMEL (236).
Pleurodictyum constantinopolitanum, F. Roem., Devonian, Asia Minor, pl. ii, fig. 7; KAYSER (140).
P., sp. (? *P. megastomum*, McCoy MS.), fig., Upper Silurian, Victoria; DUN (78).
Ræmeria, M. E. & H., revision of genus; *Ræmeria*, n. sp., pl. xv, figg. 5-8; *R. minor*, Schlüter, pl. xv, figg. 9-13; WEISSERMEL (235).
Syringopora reticulata, Goldf., pl. xv, fig. 1; *S. fascicularis*, L., pl. xv, fig. 2; *S. tenuis*, Schlüter, pl. xv, figg. 3 & 4; WEISSERMEL (235).
Syringopora bifurcata, d'Orb., p. 67, fig. 5; WEISSERMEL (236).
S. reticulata, Gold., Alpi Carniche, OSSAT (186); Carboniferous, Moara Creek, N. S. Wales, KONINCK (147).
S. auloporoides, n. sp., Carboniferous, Moara Creek, N. S. Wales; KONINCK (147).
S. bellensis, n. sp., Siluro-Devonian Limestone, Wellington, N. S. Wales, pl. xvi; ETHERIDGE (84).
Tetradium cellulosum, Hall, development; RUEDEMANN (198).

Incertæ sedis.

- Barrettia*, Woodward, a coral incertæ sedis and not a lamellibranch.
B. multilirata, *B. sparcilirata*, n. spp., *B. monilifera*, Woodw.; WHITFIELD (245).
Haplothecia ? *chinensis*, n. sp.; FRECH (92).
Monilipora macrostoma, F. Roem; OSSAT (186).

ALCYONARIA.

- Bellonella rubra*, n. sp., Corea; *B. cinerea*, n. sp., Hirudo Strs.; BRUNDIN (40).
Sarcophytum latum, Dana, Funafuti; WHITELEGGE (242).
Lobophytum pauciflorum, Ehr., var. *validum*, Marenz.; *L. hedleyi*, n. sp.; *L. tuberculosum*, Q. et G.; *L. confertum*, D.; *L. densum*, n. sp.;
Lobularia ? *viride*, Q. et G.;
Spongodes pallida, n. sp., Funafuti; WHITELEGGE (242).
Siphonogorgia macrospina, n. sp., Funafuti; WHITELEGGE (242).
Nephthya aurantiaca, Verrill; BURCHARDT (42).
Spongodes umbellata, Wright & Studer; *S. coronata*, W. & S.; *S. bicolor*, W. & S.; *S. brevirama*, n. sp.; *S. planoregularis*, n. sp.; *S. costatofulva*, n. sp., *S. costatocyanea*, n. sp.; BURCHARDT (42).
Suensonia, n. gen. of *Xeniidae*, *S. mollis*, n. sp., Corea; BRUNDIN (40).
Xenia, histology; ASHWORTH (13).
X. garciæ, n. sp.; BOURNE (Zool. Rec. 1896, No. 10).
Gorgonida from Funafuti; WHITELEGGE (242):—
Keroeides gracilis, n. sp.; *Acanthogorgia breviflora*, n. sp., *Anthomuricea*

simplex, n. sp.; *Villogorgia flagellata*, n. sp., *Bebryce studeri*, n. sp., *Muricella purpurea*, n. sp.; *Nicella laxa*, n. sp.; *Verrucella flabellata*, n. sp.

Paraspongodes glacialis, n. sp., Spitzbergen, figg. 4 *a*, *b*; *P. rubra*, n. sp., figg. 3 *a*, *b*; *P. fruticosa*, Sars, figg. 1, *a*, *b*, *c*; *P. clavata*, Dan., fig. 2 *a*, *b*; *P. polaris*, Dan., figg. 5 *a*, *b*; MAY (162).

Pseudocorallium tricolor, n. sp., Madeira; *P. maderense*, n. sp., Madeira; JOHNSON (138).

Euplexaura anastomosans, n. sp., Japan; *Gorgonia oppositipinna*, Ridley, Sumatra; *Melitodes stormii*, Studer, Billiton; *Plexauroides verrucosa*, n. sp.; Hirudo Strs.; *Psilacabaria frondosa*, n. sp., Hirudo Strs.; *Solenocaulon simplex*, n. sp., Chinese Sea; BRUNDIN (40).

Pennatulida.

Funiculina quadrangularis, Pallas; GRIEG (109).

Kophobelemnon stelliferum, O. F. Müller; GRIEG (109).

Virgularia gracillima, n. sp., New Zealand; DENDY (66).

ALCYONARIA [FOSSIL].

Aulopora and other species from New South Wales, see KONINCK (147), p. 34.

Aulopora anna, n. sp., *A. prosseri*, n. sp., Carboniferous, Kansas; BEEDE (18).

A. fasciculata, Silurian, Bell River, New South Wales; KONINCK (147).

A. permocarbonica, n. sp. (fig.), Russia; STUCKENBERG (220).

Cladochonus benneki, n. sp., Carboniferous, Kansas; BEEDE (18).

C. michelini, E. H. (fig.), Russia; STUCKENBERG (220).

C. tenuicollis, McCoy, Carboniferous, Burrageood, New South Wales; KONINCK (147).

Corallium inaequale, n. sp., Tertiary, Italy; ANGELIS (10).

Dybowskiella labiata, Keyserl., Russia; STUCKENBERG (220).

Isis granifera, n. sp., Oligocene, Piedmont; OSASCO (185).

I. peloritana, Seg.; *I. melitensis*, Goldf., Neogenic, Sardinia; OSSAT & NEVIANI (187); *I. gracilis*, Reuss, Neogenic; SIMONELLI (211).

Pavonaria portisi, n. sp., Tertiary, Italy; ANGELIS (10).

Pyrgia artiensis, n. sp., Russia; STUCKENBERG (220).

? *Tabulata* (*Auloporidae*), cf. WEISSERMEL (234).

CTENOPHORA.

Beroë ovata, development of isolated blastomeres and artificial production of monstrosities; FISCHER (89): segmentation; ZIEGLER (251).

Parasite of *Bolina hydatina*, Chun, described by MONTICELLI (169).

CHUN (53) has added an important monograph upon the following species collected by the Plankton Expedition in the N. Atlantic:—

Beroë cucumis, Fabr.; *B. ovata*, Bosc.; *Bolina infundibulum*, Martens; *Callianira bialata*, Delle Chiaje; *C. antarctica*, Chun; *Cestus veneris*, Les.; *Charistephane fugiens*, Chun; *Eucharis multicornis*, Quoy et Gaim.; *Eurhamphæa vexilligera*, Gegenb.; *Hormiphora palmata*; *H. spatulata*, Chun; *Mertensia ovum*, Fabr.; *Pleurobrachia pileus*, Fabr.

CŒLEENTERATA incertæ sedis.

Pemmatodiscus socialis; MONTICELLI (169).

Treptoplax reptans; MONTICELLI (169).

XVII. SPONGIÆ.

BY

PROFESSOR R. VON LENDENFELD.

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INTRODUCTION.

THE most important papers on Sponges published in 1898 are: (3) in which BIDDER dwells on the classification and skeleton of the CALCAREA and in which he gives an account of certain important deformities in Calcareous spicules; (42) in which MINCHIN describes the development of the triactines and tetractines in Ascons; (71, Part III) in which VOSMAER & PEKELHARING discuss the structure and development of the Chels; (71, Part IV) in which these authors describe the Collarcells; (38-40) in which MAAS treats of the Embryology and Blastology of Sponges; (35) in which LOISEL publishes some histological and physiological observations; (70 & 71, Part I) in which VOSMAER & PEKELHARING dwell

on the nutrition of Sponges; (17, 18, 29, 46 & 47) in which DELAGE, LACAZE-DUTHIERS & PERRIER discuss the relation of Sponges to other animals and their systematic position; and the systematic papers by BREITFUSS (4-11) on *Calcarea* and by IJIMA (23), KIESCHNIK (24), LINDGREN (34), THIELE (60) and TOPSENT (61, 64, 65) on *Silicea*.

I. TITLES.*

1. ALLODI, R., NICOLICH, P. & VALLE, A. La pesca della spugne. Decimo congresso generale della Societa austriaca di Pesca e Piscicoltura marina tenuto a Trieste le 8 maggio 1898, pp. 77-82.
2. BARROIS, C. Sur les Spongiaires de la Craie du Nord-Est du Bassin de Paris. Bull. Soc. geol. France, xxvi, pp. 327-329.
3. BIDDER, G. The skeleton and classification of Calcareous Sponges. P. R. Soc. London, lxiv, pp. 61-76, 10 figg. Summary: J. R. Micr. Soc. 1898, pp. 633 & 634.
BRANDT, K. (7) Zool. Rec. 1896. [Summary: Zool. Centrbl. v, pp. 38-42.]
4. BREITFUSS, L. Catalog der Calcarea der zoologischen Sammlung des königlichen Museums für Naturkunde zu Berlin. Arch. Naturg. 1897 (appeared 1898), pp. 205-226, 2 figg.
5. ——. Kalkschwammfauna der Westküste Portugals. Zool. Jahrb. Syst. xi, pp. 89-102, pl. 11. [Summary: J. R. Micr. Soc. 1898, p. 434.]
6. ——. Die Kalkschwammfauna von Spitzbergen. Nach den Sammlungen der Bremer Expedition nach Ost-Spitzbergen im Jahre 1889 (Prof. W. Küenthal und Dr A. Walter). Zool. Jahrb. Syst. xi, pp. 103-120, pls. 12 & 13. [Summary: J. R. Micr. Soc. 1898, p. 434.]
7. ——. Die Kalkschwämme der Sammlung Plate. Zool. Jahrb. Syst. Supplement, iv, pp. 455-470, pl. 27. [Summary: J. R. Micr. Soc. 1898, p. 547.]
8. ——. *Amphoriscus semoni*, ein neuer, heterocöler Kalkschwamm. Semon, Zoologische Forschungsreisen in Australien und dem Malayischen Archipel, v. Denk. Ges. Jena, viii, pp. 383 & 384, 3 figg.
9. ——. Kalkschwämme des Weissen Meeres und der Eismeerküsten des Europäischen Russlands. Mit Berücksichtigung und Aufstellung der Kalkschwammfauna der Arktischen Region. Mem. Ac. St Petersburg. (8) vi, 41 pp., 4 pls. [Summary: J. R. Micr. Soc. 1898, p. 634.]
10. ——. Die arktische Kalkschwammfauna. Arch. Naturg. 1898, pp. 277-316.
11. ——. Note sur la faune des Calcaires de l'Océan arctique. Annuaire Mus. St Petersburg. 1898, pp. 12-38 [sep. pp. 1-27].
12. BRICE, J. The Fish and Fisheries of the Coastal Waters of Florida. Rep. U. S. Fish. Comm. for 1895 & 1896. (Sponges, pp. 266-278, 299-306, 317-320, 324, 341).

* An asterisk prefixed to a quotation indicates that the Recorder has not seen the Journal or Work referred to. The titles without date refer to papers published in 1898; to the titles of papers omitted in last year's record, the date (1897) is attached.

13. *CALKINS. Report on the Protozoa and Cœlenterates of Puget Sound and the Alaskan Bays. Tr. N. York. Ac. for 1896. [Summary: Zool. Anz. xx, p. 15, 1897.]
14. *CAR, L. *Spongilla lacustris* (L.). Glasnik Naravasl. druzt. x, p. 228.
15. *COUTIÈRE, H. Observations sur quelques animaux des récifs madréporiques de Djibouti. Bull. Mus. Paris, 1898, pp. 274–276.
16. *CUÉNOT, L. Les moyens de défense chez les animaux. Bull. Soc. zool. France, xxiii, pp. 37–58, with fig.
17. DELAGE, Y. Sur la place des Spongiaires dans la classification. C.R. Ac. Sci. cxxvi, pp. 545–548. [Summaries: J. R. Micr. Soc. 1898, pp. 434 & 435; Rev. Scient. (4), ix, p. 276.]
18. —. Les larves des Spongiaires et la homologation des feuillets. C.R. Ac. Sci. cxxvi, pp. 767–769. [Summary: Rev. Scient. (4) ix, p. 370.]
19. DENDY, A. On the Sponges described in Dieffenbach's New Zealand. Tr. N. Zealand Inst. xxx, pp. 316–320, pls. 33 & 34.
20. *FRAAS, E. Die Bedeutung der Seeschwämme für die Geologie und speziell für den schwäbischen Jura. Jahresb. Ver. Wurttemb. liii, pp. vii & viii, 1897.
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21. GUIART, J. Quatrième Congrès international de Zoologie tenu à Cambridge (Angleterre) en août 1898. Compte-rendu sommaire. Bull. Soc. zool. France, xxiii, pp. 135–147.
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23. IJIMA, I. The Genera and Species of Rossellidæ. Annot. zool. Japon. ii, pp. 41–55. [Summary: Quart. J. Micr. Sci. 1898, p. 547.]
24. KIESCHNICK, O. Kieselschwämme von Amboina (Inaug. Diss.). Jena, 65 pp.
25. KIRK, H. Notes on New Zealand Sponges. Fourth Paper. Tr. N. Zealand Inst. xxx, pp. 313–316, 2 pls.
26. *KNIPOWITSCH, N. Ueber den Reliktensee Mogilnoje auf der Insel Kildin an der Murmanküste. Bull. Ac. St Petersburg. (5), iii, pp. 459–473, 1 pl.
27. KUMM, —. Neuere Untersuchungen fossiler Schwämme, vornehmlich aus Westpreussen. Schr. Ges. Danzig (n. s.), ix, 4 pp.
28. *KUSNETZOW, J. Fischerei und Thiererbeutung in den Gewässern Russlands. Ministerium für Landwirthschaft und Reichsdomänen. Department für Landwirthschaft. St Petersburg, 120 pp.
29. LACAZE-DUTHIERS, H. Les Éponges, sont-elles des Cœlentérés? Arch. Zool. exp. (3), Notes, vi, pp. ii–vi.
30. *LAMPERT, K. Ueber die Geschichte der lebenden Glasschwämme. Jahresb. Ver. Wurttemb. liii, pp. viii & ix.
31. LEE, A. & MAYER, P. Grundzüge der mikroskopischen Technik für Zoologen und Anatomen, Berlin, 470 pp. (Sponges, pp. 261, 265, 409–411.)

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32. —. Neuere Arbeiten über Spongien. Zusammenfassende Übersicht. Zool. Centrbl. v, pp. 689-698.
33. LEONHARD, R. Die Fauna der Kreideformation in Oberschlesien. Palæontogr. xlv, pp. 11-70, pls. 3-6, 1897.
34. LINDGREN, N. Beitrag zur Kenntniss der Spongienfauna des Malayischen Archipels und der Chinesischen Meere. Zool. Jahrb. Syst. xi, pp. 283-378, pls. 17-20.
35. LOISEL, G. Contribution à l'histo-physiologie des Éponges; I. Les fibres des Reniera; II. Action des substances colorantes sur les Éponges vivantes. J. Anat. Physiol. norm. path. xxxiv, pp. 1-43, 187-234, pls. 1, 5.
36. *——. Contributions à l'histo-physiologie des Éponges. (2^e note, Les fibres des Reniera.) C.R. Soc. Biol. (10), v, pp. 68 & 69.
37. *LÖNNBERG, E. Undersögningar Rörande Oeresunds Djurlif. Meddel. Kongl. Landtbruksstyrelsen. No. 43, Upsala, 77 pp., 1 map.
38. MAAS, O. Die Keimblätter der Spongien und die Metamorphose von *Oscarella* (*Halisarca*). Zeitschr. wiss. Zool. lxiii, pp. 665-679, pl. 41. Summary: J. R. Micr. Soc. 1898, p. 435.
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40. —. Die Entwicklung der Spongien, eine Zusammenstellung der Thatsachen und Folgerungen auf Grund neuerer Arbeiten. Zool. Centrbl. v, pp. 581-599 [sep. 1-19], 12 figg.
41. MEUNIER, S. Observation complémentaire sur le *Spongiomorpha saportai* Stan. Meun. Naturaliste, xix, p. 257, 1 fig. 1897.
42. MINCHIN, E. Materials for a monograph of the Ascons. I. On the origin and growth of the triradiate and quadriradiate spicules in the Family Clathrinidæ. Quart. J. Micr. Sci. xl, pp. 469-587, pls. 38-42. Reprint: Linacre Reports, No. 12. [Summary: J. R. Micr. Soc. 1898, pp. 312-314.]
43. MOORE, J. *Hyalodendron navalium*, a new genus and species of Euplectellid Sponge. P. Ac. Philad. 1898, pp. 430-434, 2 pls.
44. NÖLDEKE, B. Porifera. Zool. Jahresber. 1897, 6 pp.
45. PERRIER, E. Les colonies animales et la formation des organismes. 2nd ed. Paris, xxxii and 797 pp., 164 figg., 2 pls.
46. —. Sur la place des Éponges dans la classification et sur la signification attribuée aux feuillets embryonnaires. C.R. Ac. Sci. cxxvi, pp. 579-583. English translation: Ann. Nat. Hist. (7), i, pp. 408-412. [Summaries: J. R. Micr. Soc. 1898, pp. 434 & 435; Rev. Scient. (4), ix, p. 309.]
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II. BIOLOGY.

1. MORPHOLOGY and PHYSIOLOGY.

A. GENERAL [cf. Titles 3, 38, 39, 40, 42, 45].

The *Clathrina*-species are, according to MINCHIN (42), reticulate tubes. The walls of these tubes consist of a gastral and a dermal lamella. The former is simple, the latter composed of two layers, a superficial epithelial layer and a lower connective tissue layer. MINCHIN (42) failed to find—although he particularly looked for them—cells (nuclei) in the process of division.

B. SKELETON [cf. Titles 3, 16, 27, 34, 35, 36, 39, 42, 48, 71].

BIDDER (3) thinks that the tension which exists in the sponge-tissue exerts a great influence on the shapes assumed by the spicules. He considers the spicules of the *Calcarea* as "skeleton crystals of Calcite." The abnormalities of the (calcareous) triactines with equal angles (of 120°) observed by him are usually due to an angular bend of 60° or a multiple of 60° in one or more of the rays. From this fact the conclusion is drawn, that crystalline forces determine the mode of growth of these spicules. Glycerin-corrosions of spicules also tend to show that they are crystalline in nature. The spines of the apical ray of the tetractines of *Ascetta cerebrum* are situated in three planes enclosing angles of 120°. BIDDER thinks that the spicules have been phylogenetically developed from a simple rod composed of organic substance in which carbonate of lime was

deposited and that this replaced the original organic substance more and more. Finally there was so little of the latter left that the carbonate of lime was enabled to crystallise. The fact that the rays of calcareous spicules are often curved is no proof of their non-crystalline nature.

According to MINCHIN (42) the triactines of Ascons are formed in the following manner: Cells of the dermal epithelium pass down into the interstitial layer and there arrange themselves in trifoil-shaped groups of three. These trifoils are orientated tangentially. Each element of the trifoil is divided into a distal and a proximal cell so that two cell-trifoils are produced, one lying above the other. The three rays of the triactine originate independently of each other between the nuclei of the upper and lower trifoil cells, probably within the lower cells. The three rays then coalesce and grow in length, the lower cells of the trifoil moving towards the apices of the rays. These cells disappear after a time. The further growth of the spicule is due to the action of the three other (upper) trifoil cells. These cells extend and envelope the rays completely. They also move towards the apices of the rays and secrete lime as they go, increasing the ray to its full thickness at first at the base, then in the middle and finally at the end. The tetractines are developed from triactines by the addition of a separately formed fourth (apical) ray. This ray is produced by a cell derived through cell-division from a pore-cell. In the case of long apical rays the nucleus of this cell divides; short apical rays are produced by cells which remain simple. The rhabds are produced by several cells, all derived from the same mother cell. In the process of secreting lime and building up the spicule the nucleus, or rather the chromatin, appears to play an important part. It is simple in the cells producing the smooth, but split up into several fragments in the cells producing the spined apical rays of the tetractines of *Ascetta cerebrum*. The first part of the ray produced the axial thread; this consists of organic substance, can be stained with Nigrosin and shows no crystalline structure under the polariser.

MINCHIN (42) is of opinion that the spicules of the *Calcarea* phylogenetically originated in calcareous excretions. These were at first irregular. Through selection they eventually became rod-shaped thus being developed into rhabds. MINCHIN considers the rhabd as the primary form of calcareous spicule. Joining in threes and fours these rhabds produced triactines and tetractines. The rays of some triactines becoming unequal, one rudimentary and the two others extended in one straight line, also "secondary" rhabds were produced, which must not be confounded with the original primary rhabds. In the regularity of the spicules MINCHIN sees an adaptation to the exigencies of the sponge and not an effect of the action of merely mechanical causes. This view is confirmed by the fact that irregular spicules are much more numerous in the larva than in the adult.

MAAS (39) has studied the spicule-formation in Sycons. The rhabds are the first spicules to appear. These are usually produced in great numbers in the epithelial cells directly after, rarely before fixation. Afterwards tetractines are formed. The rhabds are produced by one cell each, the tetractines by several. The basal rays of the tetractines are secreted first, forming a triactin; to this the fourth (apical) ray is afterwards added. These basal rays (triactines) are joined from the beginning and not as in Ascons at first separate. The rhabds protrude with the greater part of their length beyond the surface. They appear as if only their proximal part were formed by the mother cell and "der Rest Krystall-ähnlich anschliessen würde." At first the spicules are arranged irregularly. Later, when the osculum is formed, the rhabds accumulate round the osculum and at the base of the sponge forming a wreath round the former and the root-tuft at the latter. Then the large rhabds of the oscular

crown appear. Each one of these is produced by numerous cells. These rhabds are at first only few in number (4—6). The tetractines are arranged irregularly and independently of the (much more numerous) pores. Together with the chambers (radial tubes) the rhabds of the chamber-crowns make their appearance. These are originally disposed like tent-poles from which the chamber is suspended. Finally the sagittal triactines of the tubar skeleton; a second kind of tetractines with the apical ray pointing outward, and the small, curved, hookshaped tetractines at the Osculum are produced.

MINCHIN (42) gives a critical résumé of the opinions held by various authors concerning the origin of the siliceous spicules of sponges.

KUMM (27) describes the structure of the skeleton in the fossil *Astyspongia* and *Aulocopida*.

LINDGREN (34) describes the structure and development of the Pseudosterrasters in *Placospongia* and comes, as the Recorder had done before him, to the conclusion that they are fundamentally different from the Sterrasters of the *Geodida*.

VOSMAER & PEKELHARING (71) give a detailed account of the structure and development of the chels of the *Desmacidonida*. The first part of the chel produced is the shaft. This has the shape of a sigma. They consider chels and sigmas as spicules of the same kind.

LINDGREN (34) describes a curious kind of chel with a ring of 8—12 spines from a species of *Jotrocha*. This chel is very similar to certain hexactinellid spicules.

LINDGREN (34) distinguishes three kinds of "echinating" spicules in the *Ectyonina*: (1) smooth, (2) spined with parallel spines, and (3) spined with the spines of the two ends converging.

LOISEL (35, 36) describes bundles of fine longitudinal threads in *Reniera ingalli* and *R. elegans*. These threads consist of a substance apparently very similar to Spongin and are sometimes naked and sometimes invested by a granular sheath. They are produced by certain cells of the interstitial layer ("cellules sphéruleuses") which arrange themselves in rows like pearls on a string. Each one of these cells forms in its interior a small rod. These rods are then joined to form the thread. Finally the cells disappear and only the thread remains.

PETR (48) is of opinion that the loose, so-called "Parenchymnadeln" of Spongillids which are identical with the gemmule spicules, do not form part of the somatic skeleton but belong to the gemmule skeleton.

C. EPITHELIA, CUTICULA [cf. Titles 6, 39, 42, 70, 71].

Concerning the origin and blastological nature of the epithelia, MAAS (39) and MINCHIN (42) combat the opinion, originally expressed by F. E. SCHULZE and since pretty universally accepted, that the cells clothing the ciliated chambers and the excurrent canals are to be considered entodermal, those clothing the outer surface and the incurrent canals ectodermal. According to the authors named the collar-cells alone are entodermal, all other epithelia, including the pavement epithelia of the inner side of the oscular margin of Ascons and the oscular tube of Sycons, ectodermal.

According to MINCHIN (42) the external epithelium of the *Homocæla* consists of contractile pavement cells, which become mushroom-shaped when contracted. The limits of these cells are difficult to make out; their nucleus is spherical. In the protoplasme of these cells which is chiefly accumulated round the nucleus, spherical granules of apparently chitineous nature are met with. These granules are variously pigmented and give their colour to the sponge. The Pore-cells of Ascons are, according to MINCHIN (42) also ectodermal elements. These cells are ring shaped and

the pore itself is intracellular. A thin sphincter-membrane extending inwards from the body of the pore-cell surrounds the pore. This membrane is very contractile and can reduce the width of the pore and entirely close it. As this membrane is situated outside the pore-canal itself appears funnel-shaped, widening proximally. VOSMAER & PEKELHARING (70) who also observed these pore-cells on the contrary find this canal outside wider than inside. MINCHIN (42) describes centripetal processes of the pore-cells which extend for some distance between the collar-cells. The pavement cells inside the oscular margin which become—as the sponge grows—scattered over the surface are, according to MINCHIN (42), afterwards converted into the pore-cells. Some of the latter however originate from the external Epithelium. In hardened Ascons these pore-cells are usually closed. Such closed pore-cells have previously been variously described by Metschnikoff, Carter, Lendenfeld, Dendy and Topsent as symbiotic Algæ, collar-mother-cells, etc.

According to BREITFUSS (6) the collar-cells of *Sycetta asconoides* appear to possess more than one flagellum. In the interstices between the collar-cells of *Ebnerella kükenthali* a protoplasma-like substance is met with.

According to MINCHIN (42) the collar-cells of Ascons stand close together and form, in the expanded sponge, a single layer. When the sponge contracts they come to lie in several layers. VOSMAER & PEKELHARING (71) find the collar-cells of different sponges very different in shape. The basis is irregular and sometimes has processes. The flagellum is cylindrical and thin, the collar longer than broad. In the preparations the collar sometimes becomes longitudinally folded. The authors named assume that these folds, which, stained with Methylen blue, appear as longitudinal stripes, led Bidder to the assumption that the collar is composed of rods.

D. INTERSTITIAL LAYER [cf. Titles 35, 42].

According to MINCHIN (42) the tissue lying between the outer and the inner epithelia consists (in Ascons) of a structureless jelly-like substance containing spicules, spicule mother-cells, nutritive wandering cells, some rich and some poor in granules, and small cells which may be young stages of the foregoing. He does not discuss the sexual products. LOISEL (35) describes the ground-substance of the interstitial layer in *Reniera* as slimy, and compares it with the ground-substance in the Umbrella of the Medusæ, and the lymph and blood of higher (cœlomat) animals.

E. SEXUAL CELLS, PROPAGATION AND DEVELOPMENT [cf. Titles 38, 39, 40, 42].

According to MINCHIN (42) spicules first occur in the larva of *Homomandra falcata* on the second day after fixation. These are triactines. The rhabds and tetractines are produced much later.

MAAS (38) dwells on the swarming larva and the metamorphosis of *Oscarella lobularis*. The cells of the hinder, red part of the larva, are larger than the others. The larva is a simple blastula and contains no cells in its interior. Invaginations often occur, chiefly in the anterior part. These are of no embryological importance. If the invagination is shallow enough it soon disappears again; if it is too deep, then the larva dies. The cells of the hinder end become more and more clearly distinguished from those in front and attain the character of macromeres. The larva attaches itself with the fore end, which is composed of the flagellate micromeres. These cells are invaginated during the process of fixation, and then the macromeres form the outer surface. Thus the difference between the development of *Oscarella* as described by HEIDER,

and the development of other sponges does not really exist: *Oscarella* develops in the same way as all other sponges.

In another paper (39) MAAS publishes his observations on the metamorphosis of *Sycandra setosa* and *raphanus*. The sponge, after fixation first assumes the shape of a tubular Ascon. The whole of the inner side of the tube, with the exception of a small rim just inside the osculum, is clothed with collar-cells. That oscular rim bears flat pavement-cells. The ciliated chambers (radial tubes) are formed in circles round the oscular end of the tube, always growing out from those parts of it which are internally covered with collar-cells. The pavement-cells, which in the adult sponge clothe the oscular tube and form small rims inside the mouths of the chambers, are neither derived from the flat epithelium inside the oscular rim of the young Ascon stage, nor from the collar-cells in the lower part of the tube. They are nothing else than ectodermal pavement-cells of the outer surface which, penetrating the tube-wall, immigrate into the interior and there clothe the oscular tube and the proximal parts of the chambers.

In a third paper (40) MAAS gives a general account of our present knowledge of the embryology of sponges, well illustrated with schematic figures. He also discusses the conclusions to be drawn from the embryological facts.

F. PHYSIOLOGY [cf. Titles 34, 35, 42, 62, 69, 70, 71].

BIDDER (3) dwells on the tension of the tissues in living sponges. This tension is indicated by the shape of the surface in the places where spicules protrude. It is balanced by the pressure of the water in the chambers and excurrent canals, this pressure being caused by the action of the flagella in the ciliated chambers. As soon as the flagella cease to move the pressure disappears: alone acting and no longer counterbalanced, the tissue tension then causes a contraction of the whole sponge.

LINDGREN (34) expresses the opinion that the echinating spicules of the *Ectyoninæ* have the function of fastening the soft parts of those sponges to their skeletal fibres.

MINCHIN (42) considers it possible that the pore-cells of Ascons perform scleroclastic functions, that they eat up spicule fragments. They certainly possess vacuoles apparently containing lime.

LOISEL (35), VOSMAER & PEKELHARING (69, 79, 71), and TOPSENT (62), publish observations on the resorption of various substances by sponges. LOISEL (35) chiefly stained live sponges with anilin dyes, Neutral red, Bismarck brown, Nile blue, Congo red and Methylen blue. The last named very soon again disappears, the other colours mentioned remain in the sponge-tissue for a considerable time. All these colours are—like carmine—afterwards found in vacuoles of cells of the interstitial layer. If live sponges are treated simultaneously with different anilin dyes various effects are produced. If Bismarck brown and Neutral red are used a mixture of these colours is met with in the vacuoles. If Nile blue and Neutral red are used one finds in some vacuoles the one colour, in others the other. The blue and red vacuoles thus produced can be met with together in the same cells, or all the vacuoles are red in some cells, and all vacuoles blue in others. Congo red also stains the nucleus. This colour at first excites the cells to livelier movements. Distilled water very soon causes the granular cells to burst. After feeding the sponge (*Spongilla*) with carmine, carmine granules are also met with in the interstitial cells where they lie in clusters in the vacuoles. LOISEL further states that the cells of the interstitial layer, which absorb the nourishment, have an acid reaction: the Congo red taken up by them becomes blueish, blue litmus red.

TOPSENT (62) discusses LOISEL's results, and states that he considers the cells of the interstitial layer as the nutritive elements of sponges. He says that he has observed—after feeding siliceous sponges with carmine—the pigment granules in interstitial cells but not in the collar-cells. Only in the cavity of the collar, not in the body of the cell itself, carmine-granules were met with.

VOSMAER & PEKELHARING (69, 70, 71) give an account of the views held by the authors on the subject of sponge-nutrition, and then describe the results of their own experiments. They fed *Spongilla* and *Sycandra* with carmine and milk, and examined the specimens after different intervals of time. Directly after a period of feeding extending over $\frac{1}{2}$ —2 hours numerous granules of the substance used are met with in the collar-cells. After feeding for 24 hours such granules also occur in the cells of the interstitial layer. If the sponges, after having been fed, are kept for some hours in clean water hardly any milk- or carmine granules are found in the collar-cells, but still numerous granules in the cells of the interstitial layer. The authors came to the following conclusion: "We believe we are entitled to say that the choanocytes really are the organs by which particles suspended in the water, passing the canals, are captured and thus brought into the tissue of the body." They do not believe that the collar-cells, when filled with the granules, sink into the interstitial layer, and changing their character, become interstitial cells. They assume that the granules taken up by the collar-cells are transmitted from them to the interstitial cells in which they are afterwards found.

VOSMAER & PEKELHARING (69, 70, 71) state that the water current passing through the sponge, which conveys the nutritive material into the ciliated chambers, never is, and never can be, reversed. They do not think that it is caused by a pendular movement of the flagella of the collar-cells towards the chamber mouth, and assert, that the flagella move in all directions and in a perfectly irregular manner. The collar-cells on the margins of the chamber-pores are supposed to act as valves, closing the pores when the pressure inside the chamber is greater than outside, and opening them when the pressure outside is greater than inside. The irregular movement of the flagella is supposed to produce irregular vortices and differences of pressure in the chamber, which, by the aid of the valvular arrangement mentioned, produce the water current. Oscular chimneys aid in the production of this current.

G. HABITS, BIONOMICS [cf. Titles 16, 20, 34, 41, 57].

CUÉNOT (16) describes some defensive arrangements in sponges.

FRAAS (20) states that the sponges of the White Jura in the Swabian Alp formed reefs like coral-reefs. In the reefs themselves the sponge-remains are very greatly metamorphosed and hardly recognisable, but in the sedimentary layers round the reef well preserved sponge skeletons abound.

According to LINDGREN (34) a sort of filter composed of styles covers the Osculum in *Sidonops picteti*. This filter prevents the entrance of parasites.

MEUNIER (41) dwells on the association of *Spongiomorpha saportai* with *Gastrochena*, SPANGENBERG (57) on the association of *Eusiphonella* with *Cnemidiastrum*.

H. SPONGE CULTURE and SPONGE FISHING [cf. Titles 1, 12, 22, 28, 51, 53].

Sponge fishing in the Adriatic: ALLODI, NICOLICH & VALLE (1); at Lampedusa: HESSE (22); European generally: ROCHÉ (51); Florida:

BRICE (12). On the capture of bath sponges in general: SCHENKLING (53).

KUSNETZOW (28) gives an account of the practical uses dried Spongillids are put to in Russia. The young ladies there rub their faces with them so as have rosy cheeks.

2. GEOGRAPHICAL DISTRIBUTION.

A. GENERAL [cf. Titles 10, 11, 34].

BREITFUSS (10, 11) defines the (marine) arctic region as limited by the northern coast of Europe, Asia and America. In consequence of the low temperature of the shallow water in that region the difference between the life-conditions in the littoral and abyssal zones is not so great there as elsewhere. He discusses the arctic *Calcarea*-fauna and states that 23 of the 42 arctic species known have also been found outside the arctic region.

LINDGREN (34) dwells on the distribution of the Pacific sponges.

B. FAUNISTIC [cf. Titles 4—11, 13, 15, 19, 24—26, 34, 37, 50, 54, 55, 58, 60, 63, 64, 66, 68, 75].

Continent of South America.—WELTNER (75) describes the new form *talaensis* of *Ephydatia ramsayi* from the Argentine, the first Spongillid recorded from that country. Another form of this species is described by the same author from the Napota river in Paraguay.

European coast of North Atlantic.—BREITFUSS (4) mentions one Homocœl from this region. SCOTT (55) mentions some sponges from Loch Fyne. PRUVOT (50) very carefully describes the marine fauna of the north-western coast of France. In the littoral zone siliceous sponges are abundant on the lower surfaces of loose stones and on steep parts of submerged bedrock. Syconidæ, Pachymatisma, etc., are particularly abundant in the partly submerged caves below Per'haridi, and Rec' hier Doun and other parts of this coast. In the *Zostera*-region *Calcarea* predominate. In depths of 30 to 50 metres *Desmacidon*, *Spongelia* and *Tethya* are most abundant. The map accompanying the paper is very fine. BREITFUSS (5) describes 11 species of *Calcarea* from the coast of Portugal and states that 15 species of this sponge class have hitherto been found there. LÖNNBERG (37) describes some sponges from the Oere-Sound, Norway, STEENROSS (58) from the Murmijärvi lake.

Mediterranean.—TOPSENT (63) describes 8 species of sponges from La Calle. BREITFUSS (4) mentions one Heterocœl from Algiers.

Polar Seas.—BREITFUSS (4) mentions 12 *Calcarea* from this region. VANHÖFFEN (68) describes 32 species of sponges from the coast of Greenland. BREITFUSS (9) describes 24 species of *Calcarea* from Greenland, the White Sea and the Barents Sea. BREITFUSS (6) describes 10 species of *Calcarea* from Spitzbergen. Altogether 16 species of *Calcarea* are known from that locality, 6 of these are peculiar to Spitzbergen. BREITFUSS (10, 11) gives a general account of the arctic *Calcarea*. In all 3 families, 11 genera and 42 species of *Calcarea* are known from the arctic seas. The paper is accompanied by a detailed list of localities.

Tropical Atlantic.—BREITFUSS (4) describes a Heterocœl from Tenerife. TOPSENT (64) describes two new *Lithistids* and 11 new *Monactinellids* from the Azores, and mentions a number of other sponges from that region.

Northern Pacific.—CALKINS (13) describes 14 species of Sponges from Puget Sound and Alaska Bay. THIELE describes 30 Tetractinellida and

57 Monaxonida from the Japanese coast. LINDGREN (34) describes 30 species of Silicea from the Chinese Sea.

Tropical parts of Indian Ocean and Western Pacific.—SCHULZ (54) describes eight species of Horny Sponges from Ternate. LINDGREN (34) describes 31 species of *Silicea* from the coast of Java. KIESCHNICK (24) describes eight Tetractinellids, 6 Clavulina and 17 Cornacuspongiae from Ambon and Thursday island. BREITFUSS (4) describes a Homocœl from Bougainville Island. COUTIÈRE (15) mentions some sponges from Djibouti (Djibouti) in the Gulf of Aden.

Southern Seas.—BREITFUSS (7) describes two Homocœla and seven Heterocœla from the Falkland Islands; and (4) two Calcarea from the west coast of South America. BREITFUSS (4) describes one Homocœl from the Cape of Good Hope. KIRK (25) describes 3 species of Calcarea from New Zealand; and BREITFUSS (4) a Heterocœl from the Australian Seas.

3. GEOLOGICAL DISTRIBUTION [cf. Titles 2, 20, 27, 33, 49, 59, 67, 77].

Silurian.—North America, WHITEFIELD & HOVEY (77); Bohemia, POCTA (49).

Carboniferous.—Ural and Timan, TCHERNYCHEW (59).

Jurassic.—Swabian Alp, FRAAS (20), there three horizons can be distinguished. The lower horizon is a deep-sea sediment with Hexactinellids; the middle horizon is a shallow-water deposit with Calcarea, Hexactinellida and Lithistida; the upper horizon is a shallow-water formation with Calcarea and some Lithistida.

Cretaceous.—Silesia, LEONHARD (33);—France, BARROIS (2); the Cenomanic Sponge fauna of the North-western part of France is distinguished from the South British by the prevalence of the genus *Jerea* and the absence of the genera *Siphonia* and *Hallirhoe*.

4. PHYLOGENY and CLASSIFICATION [cf. Titles 3, 17, 18, 21, 23, 24, 29, 34, 40, 42, 46, 47, 65].

DELAGE (17, 18), GUIART (21), LACAZE-DUTHIERS (29), MAAS (40) and PERRIER (46, 47) discuss the position of sponges in the Animal kingdom. DELAGE (17) considers the macromeres of the sponge larva as Ento- and the micromeres as Ectoderm. Starting from this supposition he concludes that in Sponges the Ectoderm forms the gastral, the Entoderm the dermal Epithelium and that therefore the sponges are fundamentally different from all other polycellular animals. He proposes to establish the group Enantiozoa for the sponges; this he thinks should be added, as equal in systematic value, to the groups Protozoa, Mesozoa and Metazoa.

PERRIER (46) combats the basis on which this theory rests, asserting that the blastological nature of the embryonic layers is not determined by their histological character, but by their ultimate fate. The difference between the sponges and the other polycellular animals is in this respect nothing more than a difference in the structure of the embryonic layers. This difference PERRIER tries to account for in a mechanical manner. PERRIER is however—but for other reasons—also of the opinion that the sponges form a separate group.

DELAGE and PERRIER continue this discussion in two further notes (18, 47) without however throwing fresh light on the question at issue.

LACAZE DUTHIERS (29) expresses the opinion that the sponges are not Cœlenterates, but he obviously uses the expression "Cœlenterates" in the sense of Cnidaria, thus combating a view, which, to the Recorder's knowledge, is not held by a single living Zoologist.

GUIART (21) gives an account of the discussion on the position of sponges which took place at the International Zoological Congress held in Cambridge. The official report of this discussion appeared in 1899 and will be reviewed in the Record for that year.

MAAS (40) gives a short résumé of the opinions held by various authors on the position of sponges in the animal kingdom.

BIDDER (3) suggests the possibility of a new classification of the sponges according to the position of the collar-cell nucleus.

Concerning the classification of the *Calcarea*, BIDDER (3) proposes to divide them into two groups: (1) *Calcaronea* (Nucleus of the larval and the collar-cells distal; first spicules appearing in development rhabds; triactines sagittal); and (2) *Calcinea* (Nucleus of collar-cells and (?) larval cells basal; first spicules appearing in development triactines; triactines with equal angles). MINCHIN (42) considers the angles between the rays of calcareous spicules of much greater systematic importance than the relative lengths of their rays. He proposes to divide the Ascons into two families and four genera: *Clathrinidæ* (gen. *Clathrina*, *Ascandra*) and *Leucosolenidæ* (gen. *Leucosolenia*, *Ascyssa*?). BREITFUSS (4) gives a classified list of the *Calcarea* in the Berlin Museum, with Synonyms. Elsewhere (10) BREITFUSS publishes a key for the identification of the arctic *Calcarea*.

Concerning the classification of the *Silicea* LINDGREN (34) places *Placospongia* in the *Monaxonida* and divides the species of *Tethya* into three groups. KIESCHNICK (24) publishes an ancestral tree of the sponges. He derives the *Clavulina* (through *Tethyopsilla*) from the *Tetractinellida*, the *Cornacuspongiæ* with spicules from the *Clavulina* and the Horny Sponges from siliciferous *Cornacuspongiæ*. He also considers *Placospongia* as a Monaxanid (Spirastrellid).—TOPSENT (61) criticises LENDENFELD's classification of the *Clavulina* and is of opinion that *Placospongia* does not belong to the *Monaxonida*. In another paper TOPSENT (65) places all sponges with exclusively monaxan megascleres in one group: *Monaxonida*, which he acknowledges to be artificial but which he asserts to be convenient and practical. This group *Monaxonida* is subdivided in the following manner: Ord. *Monaxonida*. I. Subord. *Halichondrina* (Fam. *Haploscleridæ*, *Pæciloscleridæ*, *Axinellidæ*); II. Subord. *Hadromerina*, 1 Sect. *Aciculidæ* (Fam. *Copatiidæ*, *Streptasteridæ*, *Tethydæ*, *Stylocordylidæ*), 2 Sect. *Clavulida* (Fam. *Clionidæ*, *Spirastrellidæ*, *Polymastidæ*, *Suberitidæ*, *Mesapidæ*). WELTNER (74) discusses the Genus *Damiria* Keller, stating that DENDY and LINDGREN have described several sponges as *Damiria* species which do not belong to this genus. IJIMA (23) proposes a new arrangement of the *Rossellidæ*. He divides this family into the four subfamilies *Leucopsacinæ*, *Lanugininellinæ*, *Rossellinæ* and *Acanthascinæ*.

5. *METHODS* [cf. Titles 31, 35, 42, 52, 71—73].

LEE & MAYER (31) recommend staining sponges with alcoholic solutions of colouring media whereby maceration is entirely prevented. The best staining material is said to be Cochenille-tincture. They also describe various methods for decalcifying, desilicifying, silvering, preserving in toto, etc.

LOISEL (35) kills marine sponges by placing them for a few moments in fresh water and then immediately stains with Congo red, Safranin and Iodine green. This is the only way to demonstrate the nuclei of the "celles sphéruleuses." It is not difficult to stain living sponges with anilin dyes. Some methods for hardening with corrosive sublimate, acetic acid, etc. are also described. It is better to enclose the sections in watery

media or Glycerine-Alcohol than in Balsam ; particularly for the study of the *Reniera* fibres.

MINCHIN (42) hardens freshly caught Ascons in a mixture of Osmic acid 1, Seawater 100 and Aqua dest. 100 for 5-10 minutes ; washes ; stains in Picrocarmine for two hours and examines in glycerine or hardens in Alcohol and sections. Fleming's solution is better for the preservation of nuclei but otherwise not so commendable as this Osmic acid method.

ROUSSEAU (52) again describes his decalcifying and desilicifying methods (*vide* Zool. Rec. 1897, Spongiæ 32).

VOSMAER & PEKELHARING recommend the following method for studying isolated Collar-cells : hardening in 1% Osmic acid for 1 hour, macerating in Aqua dest., staining with Methylen blue. They also describe a method for fixing sections of siliceous sponges, which are apt to float off, to the slide.

WELTNER (73) and WASHBURN (72) dwell on the preservation of Fresh-water Sponges. The former recommends Formol.

III. SYSTEMATIC.

CALCAREA.

HOMOCÆLA [cf. Titles 4, 6, 7, 9, 10, 42].

Leuconsolenia nanseni, BREITFUSS, Zool. Jahrb. Syst. xi, p. 106 ; *L. falklandica*, BREITFUSS, Zool. Jahrb. Syst. Supplement, iv, p. 458 ; *L. multiformis*, BREITFUSS, Mem. Ac. St. Petersb. (8) vi, p. 15 : n. spp.

HETEROCÆLA [cf. Titles 4-9, 25].

Sphenophorina, n. g., BREITFUSS, Mem. Ac. St. Petersb. (8) vi, p. 29.

BREITFUSS describes the following new species :

Sycetta asconoides, Zool. Jahrb. Syst. xi, p. 108 ;
Ebnerella kükenhali, p. 112, *schulzei*, t. c., p. 113 ;
Pericharax polejævi, t. c., p. 116 ;
Sycon incrustans, BREITFUSS, Zool. Jahrb. Syst. Supplement, iv, p. 461 ;
S. karajakense, BREITFUSS, Arch. Naturg. 1897, p. 207 : n. spp.
Amphoriscus semoni, BREITFUSS, Denk. Ges. Jena, viii, p. 283, redescribed.

BREITFUSS, Mem. Ac. St. Petersb. (8) vi, describes the following new species :

Grantia monstrosa, p. 24 ;
Amphoriscus murmanensis, p. 27 ;
Ebnerella lanceolata, p. 28 ;
Sphenophorina singularis, p. 29.

KIRK, Tr. N. Zealand Inst. xxx, describes the following new species :

Sycon pedicellatum, p. 313 ; *ornatum*, p. 314.

BREITFUSS, Zool. Jahrb. Syst. Supplement, iv, describes the following new species :

Leuconia platei, p. 463 ; *fernandensis*, p. 466 ; *masatierræ*, p. 467.

BREITFUSS, Zool. Jahrb. Syst. xi, describes the following new species :

Leuconia coimbrae, p. 99 ; *prava*, p. 100.
Leuconia lendenfeldii, BREITFUSS, Arch. Naturg. 1897, p. 208, n. sp.

SILICEA.

TRIAXONIA.

HEXACTINELLIDA [cf. Titles 2, 3, 36, 43, 56, 59].

Hyalodendron, n. g., MOORE, P. Ac. Philad. 1898.

IJIMA, Annot. Zool. Japon, ii, establishes the following new genera :

Leucopsacus, n. g., p. 42 ;*Vitrollula*, n. g., p. 47 ;

and describes the new species :

Leucopsacus orthodocus, p. 42 ; *scoliodocus*, p. 43 ;*Vitrollula fertile*, p. 47 ; *namiyei*, p. 48 ;*Crateromorpha pachyactina*, p. 49 ; *corrugata*, p. 49 ;*Hyalascus giganteus*, p. 50 ;*Aulosaccus mitsukurii*, p. 52 ;*Staurocalyptus microchetus*, p. 53 ;*Acanthascus alani*, p. 55.*Hyalodendron navalium*, MOORE, P. Ac. Philad. 1898, n. sp.

HEXACERATINA.

(Nothing.)

TETRAXONIA.

TETRAXONIDA.

TETRACTINELLIDA [cf. Titles 24, 34, 60].

KIESCHNICK, Inaug. Diss. Jena, describes the following new species :

Tetilla violacea, p. 15 ; *rubra*, p. 18 ; *schulzei*, p. 21 ;

and redescribes :

Tetilla amboinensis, p. 10 ;*Stelletta lobata*, p. 27 ; *reniformis*, p. 29 ; *truncata*, p. 33.

LINDGREN, Zool. Jahrb. Syst. xi, redescribes :

Erylus decumbens, p. 338 ;*Caminus chinensis*, p. 339 ;*Geodia distincta*, p. 343 ; *arripiens*, p. 346 ;*Sidonops picteti*, p. 349 ;*Isops nigra*, p. 352.

THIELE, Bibl. Zool. Nr 24, describes the following new species :

Erylus placenta, p. 5 ;*Isops obscura*, p. 6 ;*Geodia hilgendorfi*, p. 8 ; *reniformis*, p. 9 ; *variospiculosa*, p. 10 ; *exigua*, p. 11 ; *cylindrica*, p. 12 ;*Stelletta validissima*, p. 13 ; *orientalis*, p. 14 ; *maxima*, p. 15 ; *naseana*, p. 16 ; *pisum*, p. 16 ; *inconspicua*, p. 17 ;*Ecionema hilgendorfi*, p. 18 ;*Pachastrella japonica*, p. 19 ;*Sphinctrella döderleini*, p. 20 ;

Thenea compressa, p. 24; *compacta*, p. 24; *calyx*, p. 24; *nucula*, p. 25;
hemisphærica, p. 25; *irregularis*, p. 25;
Craniella lentiformis, p. 26; *globosa*, p. 27; *ovata*, p. 27; *varians*, p. 27.

LITHISTIDA [cf. Title 64].

TOPSENT, Mem. Soc. zool. France, xi, establishes the following new genera :

Petromica, n. g., p. 226;
Monocrepidium, n. g., p. 229;

and describes the new species :

Petromica grimaldii, p. 226;
Monocrepidium vermiculatum, p. 229.

MONAXONIDA.

CLAVULINA [cf. Titles 24, 34, 60, 61, 64].

TOPSENT, Mem. Soc. zool. France, establishes the following new genera :

Heteroxya, n. g., p. 231;
Anisoxya, n. g., p. 234;
Sceptrintus, n. g., p. 239;
Tylexocladus, n. g., p. 242;
Raphidorus, n. g., p. 244;
Cerbaris, n. g., p. 247;

and describes the new species :

Heteroxya corticata, p. 231;
Anisoxya glabra, p. 234;
Cliona levispira, p. 235;
Sceptrintus richardi, p. 239;
Tylexocladus joubini, p. 242;
Raphidorus setosus, p. 245;
Higginsia thielei, p. 245;
Cerbaris torquatus, p. 248;
Yvesia alecto, p. 248.

LINDGREN, Zool. Jahrb. Syst. xi, redescribes the following species :

Spirastrella aurivillii, p. 322; *semilunaris*, p. 323;
Latrunculia lævis, p. 325.

KIESCHNICK, Inaug. Diss. Jena, describes the new species :

Spirastrella lacunosa, p. 45; *spiculifera*, p. 45;
Suberites mollis, p. 46.

THIELE, Bibl. Zool. Nr 24, describes the following new species :

Tethya deformis, p. 29; *amanuensis*, p. 30;
Polymastia affinis, p. 31; *simplicissima*, p. 32;
Suberites placenta, p. 39; *japonicus*, p. 39; *sericeus*, p. 39;
Prosuberites sagamensis, p. 40; *inconspicuus*, p. 40; *exiguus*, p. 40;
Cliona argus, p. 41; *concharum*, p. 42; *infrafoliata*, p. 42;
Spirastrella insignis, p. 43; *panis*, p. 43.

CORNACUSPONGIÆ.

Marine Forms [cf. Titles 19, 24, 34, 60, 64, 71, 74].

THIELE, Bibl. Zool. Nr 24, establishes the following new genera :

Amorphilla, n. g., p. 44 ;

Dactylella, n. g., p. 55 ;

Ceratopsis, n. g., p. 56 ;

and describes the new species :

Rhizaxinella clavata, p. 34 ; *excellens*, p. 34 ; *arborescens*, p. 35 ; *elevata*, p. 35 ; *incrassata*, p. 36 ; *cervicornis*, p. 36 ;

Amorphilla halichondroides, p. 45 ; *renieriformis*, p. 45 ; *papillosa*, p. 45 ; *compressa*, p. 46 ; *penicillata*, p. 46 ; *adærens*, p. 46 ;

Leucophlæus perforatus, p. 47 ; *incrustans*, p. 48 ;

Axinella copiosa, p. 49 ; *incrustans*, p. 49 ; *tenuis*, p. 50 ;

Phacellia fusca, p. 51 ; *elegans*, p. 51 ; *foliacea*, p. 52 ; *perforata*, p. 52 ; *pygmæa*, p. 52 ; *paupera*, p. 53 ;

Acanthella vulgata, p. 53 ; *aculeata*, p. 54 ; *insignis*, p. 54 ; *simplex*, p. 54 ;

Auletta consimilis, p. 55 ; *halichondroides*, p. 55 ;

Dactylella hilgendorfi, p. 56 ;

Ceratopsis clavata, p. 57 ; *expansa*, p. 57 ; *erecta*, p. 58 ; *ramosa*, p. 58 ;

Raspailia hirsuta, p. 59 ; *folium*, p. 60 ; *villosa*, p. 60.

KIESCKNICK, Inaug. Diss. Jena, redescibes :

Rhaphidophylus cylindricus, p. 53 ;

Chondrocladia ramosa, p. 57 ;

and describes the following new species :

Gelliodes ramosa, p. 47 ;

Toxochalina schulzei, p. 48 ;

Phyllosiphonia erecta, p. 49 ; *elastica*, p. 49 ;

Chalina elastica, p. 50 ;

Siphonochalina fragilis, p. 51 ;

Pachychalina conulosa, p. 51 ;

Acanthella costata, p. 52 ;

Desmacella fragilis, p. 53 ;

Rhaphidophylus cylindricus, p. 53 ;

Echinodictyum lacunosum, p. 56 ; *conulosum*, p. 56 ;

Chondrocladia dura, p. 58 ; *sessilis*, p. 58 ;

Esperiopsis viridis, p. 59.

LINDGREN, Zool. Jahrb. Syst. xi, redescibes the following species :

Halichondria (as *Halicondria*) *variabilis*, p. 285 ; *armata*, p. 285 ; *dura*, p. 286 ;

Petrosia nigricans, p. 287 ;

Chalina pulvinatus, p. 295 ;

Siphonochalina truncata, p. 296 ;

Gellius strongylatus, p. 298 ;

Esperella macrosigma, p. 301 ;

Clathria ramosa, p. 308 ;

Dendoryx mollis, p. 305 ;

Rhaphidophylus ridleyi, p. 310.

DENDY, Tr. N. Zealand Inst. xxx, redescibes the following species :

Axinella (*Spongia*) *sinclairi*, p. 317 ;

Chalina (*Spongia*) *ramosa*, p. 318 ;

Spongelia (*Spongia*) *varia*, p. 319.

- Leptosia schmidtii*, TOPSENT, Mem. Soc. zool. France, xi, p. 250, n. sp.
Raphisia spissa, TOPSENT, Mem. Soc. zool. France, xi, p. 252 redescribed.
Esperella ægagropila, VOSMAER & PEKELHARING; Verh. Ak. Amsterdam (2), vi, p. 19 redescribed.

SPONGILLIDÆ

[cf. Titles 14, 66, 67, 76].

WELTNER, Jahrb. Hamburg. Anst. xv (2. Beiheft) redescribes the following species:

Spongilla biseriata, p. 3; *böhmi*, p. 6; *sansibarica*, p. 9; *sumatrana*, p. 10.

TRAXLER, Termes. Fuzetek, xxi (transl. German), p. 314, expresses the opinion that *Spongilla novæ terræ* is a hybrid of *Heteromeyenia ryderi* and *Spongilla lacustris*.

†*Spongilla gigantea*, TRAXLER, Foldtani Kozl. xxviii (transl. German), p. 186, n. sp.

Spongilla lacustris, CAR, Glasnik Naravosl. druzt. x, p. 228, redescribed.

XVIII. PROTOZOA.

BY

ALBERT WM. BROWN, B.A., F.L.S.,
Christ Church, Oxford.

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INTRODUCTION.

THE year 1898 has been, so far as *Protozoa* are concerned, uneventful. A great deal of steady and careful work has been done, and on the whole the interest in Protozoa begins to show, after five years' steady decline, an increase. This has taken place principally in the direction of Pathology. Each succeeding year seems to bring with it more energy for dealing with the *Hæmatozoa* of Malarial fevers and allied diseases, and here the Recorder is glad to notice very marked additions to our knowledge. GRASSI, in conjunction with other authors, seems to have placed beyond

a doubt the rôle of the mosquito in the transference of disease. A full list of papers bearing on this question will be found in "Biology" under the heading "Pathology." But the interest has not been confined merely to *Malaria*. KANTHACK, DURHAM & BLANDFORD have presented their Report on Tsetse-fly disease, WAGNER has cultivated *Protozoa* from tumours and ULLRICH made observations on their relation to Cancer. *Coccidia*, as a cause of disease, are considered by WINGRADOW, and HUNT discusses the Micro-organisms of Tick-fever. Those who desire an excellent general account of the relation of Protozoa to disease cannot do better than consult SCHNEIDERMÜHL'S "Die Protozoen als Krankheitserreger des Menschen und der Haustiere," a compact and handy volume.

A prolonged study of the mitotic phenomena of *Noctiluca miliaris* has been made by CALKINS. Other nuclear problems are discussed by KUNSTLER & RHUMBLER.

BEECHER in a series of essays on the Origin and Evolution of Spines in the Animal Kingdom has considered those of the *Radiolaria*.

New *Rhizopoda* have been described by ANDRÉ (1), GARBINI (77 & 78), PIANA & FIORENTINI (161), and MONTICELLI (153), and VINASSA DE REGNY has published papers on *Radiolaria*.

The literature of the *Foraminifera* is as full as usual. A number of both recent and fossil forms are described and figured by CHAPMAN, FORNASINI, MILLET, and others. TROUESSART has described the process of conjugation in a marine Foraminiferan. Of all subdivisions of *Protozoa* the *Sporozoa* have been most discussed. A fair proportion of papers deals with the sexual reproduction of the group and the origin of micro- and megagametes. LÉGER has contributed greatly to the elucidation of their life-history and has published classifications of some sections. The papers of LAVERAN, CAULLERY & MESNIL, HAGENMÜLLER & SIEDLECKI should be consulted.

The literature of *Flagellata* and *Ciliata* is somewhat scanty. New forms have been described by some authors and the classification of the *Ciliata* discussed by STERKI (180).

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